

DRAFT

SNOQUALMIE WILDLIFE AREA MANAGEMENT PLAN
Washington Department of Fish and Wildlife



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2006

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CHAPTER I. INTRODUCTION

This plan provides management direction for the Snoqualmie Wildlife Area. This plan will be updated annually to maintain its value as a flexible working document. It identifies needs and guides activities on the area based on the Washington Department of Fish and Wildlife (WDFW) Agency Mission of “Sound Stewardship of Fish and Wildlife” and its underlying statewide goals and objectives as they apply to local conditions.

1.1 Agency Mission Statement

The Washington Department of Fish and Wildlife serves Washington’s citizens by protecting, restoring and enhancing fish and wildlife and their habitats, while providing sustainable fish and wildlife-related recreational and commercial opportunities.

1.2 Agency Goals and Objectives

The underlined goals and objectives directly apply to the management of this wildlife area. These goals and objectives are found in the Agency’s Strategic Plan.

Goal I: Healthy and diverse fish and wildlife populations and habitats

- Objective 2: Protect, restore and enhance fish and wildlife populations and their habitats.
- Objective 3: Ensure WDFW activities, programs, facilities and lands are consistent with local, state and federal regulations that protect and recover fish, wildlife and their habitats.
- Objective 5: Minimize adverse interactions between humans and wildlife.

Goal II: Sustainable fish and wildlife-related opportunities

- Objective 6: Provide sustainable fish and wildlife-related recreational and commercial opportunities compatible with maintaining healthy fish and wildlife populations and habitats.
- Objective 8: Work with Tribal governments to ensure fish and wildlife management objectives are achieved.

Goal III: Operational Excellence and Professional Service

- Objective 11: Provide sound operational management of WDFW lands, facilities and access sites.

Object 15: Reconnect with those interested in Washington’s fish and wildlife.

1.3 Agency Policies

The following agency policies provide additional guidance for management of agency lands.

- Commission Policy 6003: Domestic Livestock Grazing on WDFW Lands
- Policy 6010: Acquiring and disposing of real property
- Policy 5211: Protecting and Restoring Wetlands: WDFW Will Accomplish Long-Term Gain of Properly Functioning Wetlands Where Both Ecologically and Financially Feasible on WDFW-Owned or WDFW-Controlled Properties
- Policy 5001: Fish Protection At Water Diversions/Flow Control Structures And Fish Passage Structures

Agency Draft Policies

- Policy: Recreation management on WDFW Lands
- Policy: Commercial Use of WDFW Lands
- Policy: Forest Management on WDFW Lands
- Policy: Weed Management on WDFW Lands

- Policy: Fire Management on WDFW Lands
- Other policies/contractual obligations/responsibilities

1.4 Snoqualmie Wildlife Area Goals

Management goals for the Snoqualmie Wildlife Area are to preserve habitat and species diversity for fish and wildlife resources, maintain healthy populations of game and non-game species, protect and restore native plant communities, and provide diverse opportunities for the public to encounter, utilize, and appreciate wildlife and wild areas. Specific management goals and objectives for the Snoqualmie Wildlife Area can be found in Chapter 3.

1.5 Planning Process

A multifaceted approach has been undertaken to identify strategies proposed for management of the Snoqualmie Wildlife Area. This process included identifying agency goals and objectives that apply to the area; a review of the purpose for purchasing the area; a review of existing habitat conditions and species present; input and review by an internal District Team consisting of local agency representatives from each agency program (Table 1), and the formation of Wildlife Area Citizens Advisory Group. The district team also helped to identify other species or habitat plans and documents pertinent to the management of the area.

Table 1. WDFW District Team Members

Enforcement	Fisheries	Habitat	Wildlife
Kim Chandler	Mark Downen	Susan Cierebiej	Curran Cosgrove
Randy Lambert	Chad Jackson	Doug Hennick	John Garrett
		Bill Mavros	Kye Iris
		Ginger Holser	Russ Link
			Ruth Milner
			Belinda Schuster

Public participation, through the formation of the Citizen Advisory Group, will be used as an ongoing means to identify social, cultural, and economic issues important to the people of Washington and the management of the wildlife area. The group will also provide input to help resolve current and future management issues and conflicts. Their participation in planning will add credibility and support for land management practices and help build constituencies for wildlife areas. This group is made up of one representative from each major stakeholder group (Table 2). Members are spokespersons for their interest groups.

Table 2. Snoqualmie Wildlife Area Citizens Advisory Group

Name	Representing
Kurt Beardslee	Washington Trout (director)
Rone Brewer	Washington Waterfowl Association (local chapter president)
Tina Cochran	Dog training interests (Cochran Kennels owner)
Edward Connor	Skagit Watershed Council
Virginia Clark	Pilchuck Audubon Society
Marilynn Dahlheim	Dog training groups (dog trainer)
Oscar Graham	WDFW Waterfowl Advisory Committee
Steve Hinton	Skagit River System Cooperative

Martha Jordan	Trumpeter Swan Society
Art Kendall	Wylie Slough Technical Committee (retired fish biologist) Washington Waterfowl Association
Dave Kush	Pheasant hunter
Michael Rasch	Fish/wildlife advocate (lawyer)
Bob Rose	Skagitians to Preserve Farmland
Tom Rutten	WDFW Land Management Advisory Committee
Allison Studley	Skagit Fisheries Enhancement Group (executive director)
Albert Vincent	Fish & Wildlife Committee for Persons with Disabilities
Sharon Walker	Fish/wildlife advocate (Snohomish Co. Parks and Recreation Dept. planner)
Keith Wiggers	Skagit Audubon Society
Dallas Wylie	Neighbor and Farmer

Other stakeholders not represented on the Citizen Advisory Group include the Washington Department of Natural Resources, and Ducks Unlimited. These entities provided input during the planning process.

Plans will incorporate cross-program input from within WDFW and review at the regional and headquarters level by the Habitat, Wildlife, Enforcement, and Fish Programs. Pertinent information from existing species plans, habitat recommendations, watershed plans, eco-regional assessments, etc. will be used to identify local issues and needs and ensure that the specific Wildlife Area Plan is consistent with WDFW statewide and regional priorities.

The Snoqualmie plan will be reviewed annually with additional input from the CAG and district team to monitor performance and desired results. Strategies and activities will be adapted where necessary to accomplish management objectives.

CHAPTER II. AREA DESCRIPTION AND MAP

2.1 Property Locations and Size

The 1,956-acre Snoqualmie Wildlife Area consists of six units in western Washington north of Seattle and just west of the Cascade mountains. Four units are in Snohomish County (Crescent Lake, Spencer Island, Ebey Island and Corson Units); two are in King County (Stillwater and Cherry Valley Units). Five of the units (all but Corson) are in the floodplain of either the Snoqualmie or Snohomish rivers. From north to south, the Corson Unit is an upland site located just north of Lake Stevens. The Spencer Island Unit is just east of the city of Everett, while the Ebey Island Unit is located between Everett and Snohomish. The Crescent Lake Unit is located three miles south of Monroe, the Cherry Valley Unit is located one mile north of Duvall, and the Stillwater Unit is located three miles north of Carnation. Unit acreage and legal descriptions are shown below in Table 3 and mapped locations in Figures 1-7.

Table 3. Unit Acreage and Legal Description

Unit	Township	Range	Section	Acres
Cherry Valley	26 N	6 E, 7E	7, 12	386
Corson	30 N	5 E, 6E	31, 36	160
Crescent Lake	27 N	6 E	23	360
Ebey Island	29 N	5 E	26,27, 34 & 35	420.5
Spencer Island	29 N	5 E	16	175
Stillwater	25 N	7 E	4 & 5	456

Figure 1. Map of Snoqualmie Wildlife Area

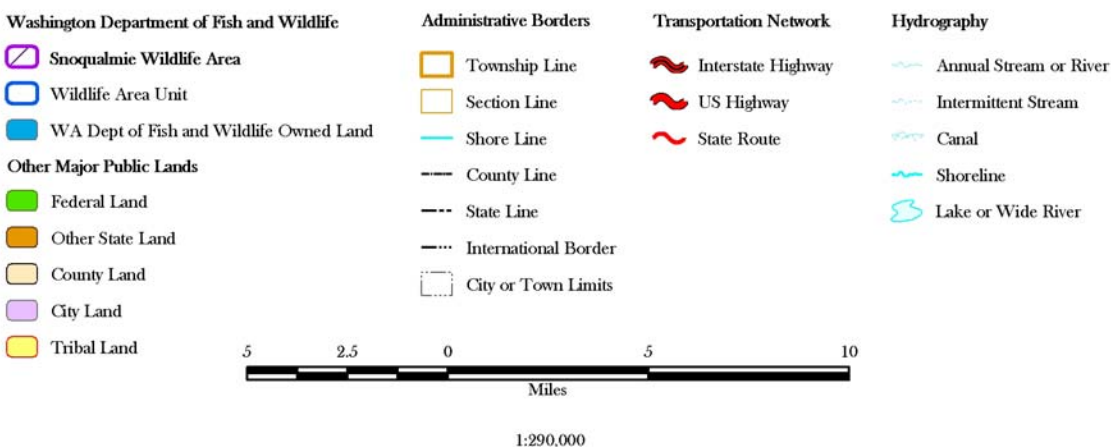
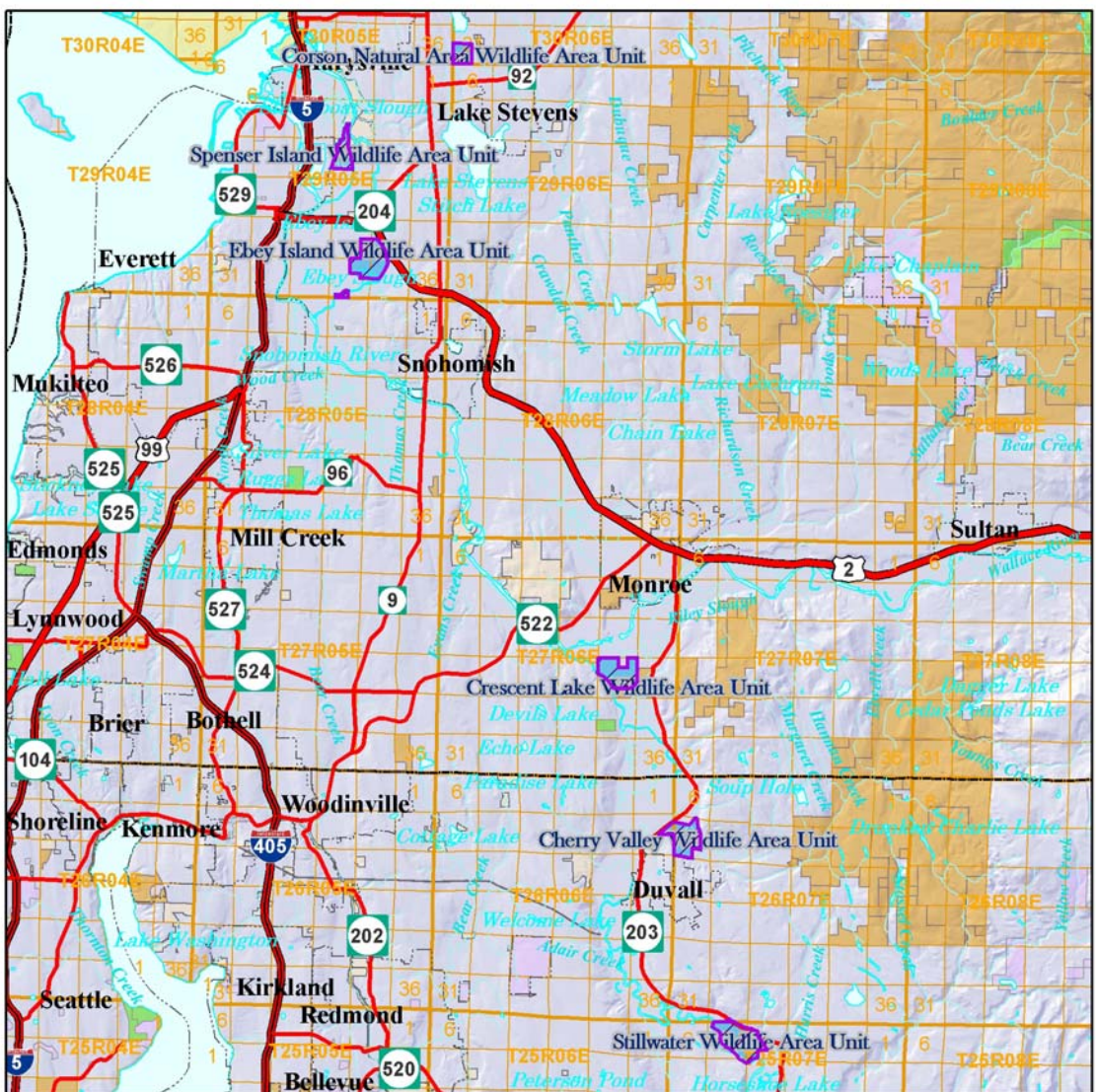
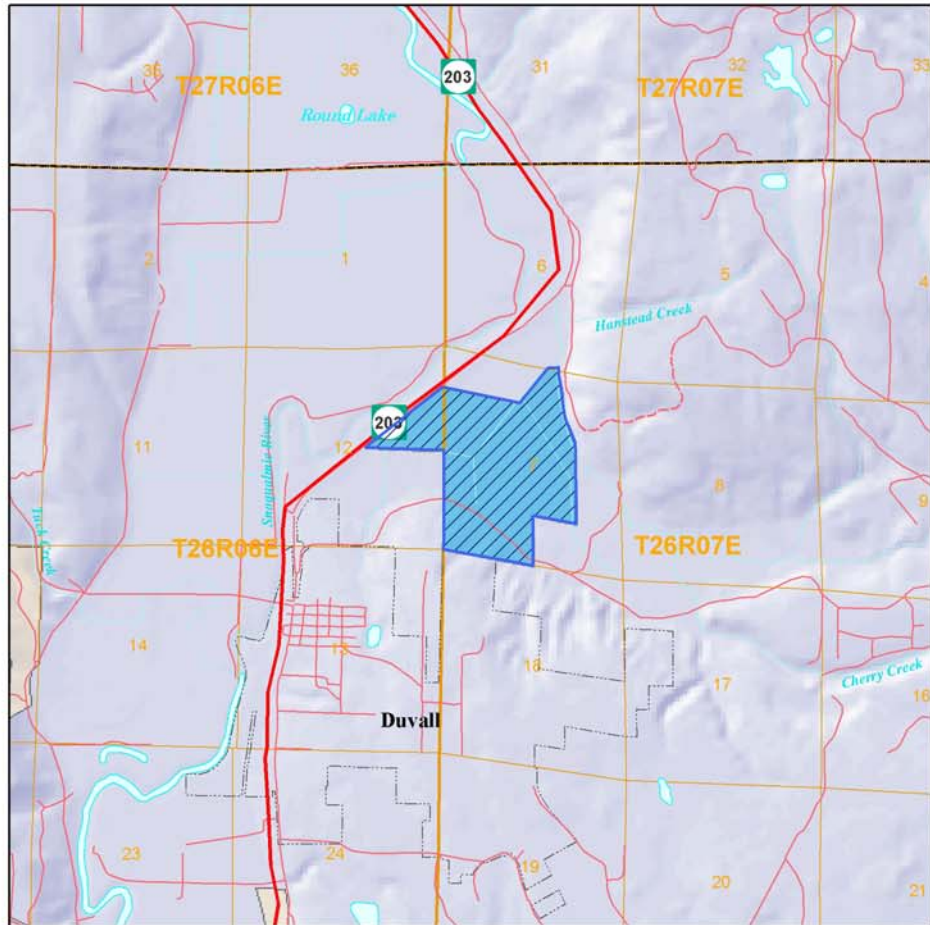


Figure 2. Cherry Valley Unit



Washington Department of Fish and Wildlife

- Cherry Valley Wildlife Area Unit
 - Conservation Easement
 - WA Dept of Fish and Wildlife Owned Land
- Major Public Land Ownership**
- Federal Land
 - Other State Land
 - County Land
 - City Land
 - Tribal Land

Administrative Boundaries

- Township Line
- Section Line
- Shore Line
- County Line
- State Line
- International Border
- City or Town Limits

Transportation Network

- Interstate Highway
- US Highway
- State Route
- Secondary Road
- Trail

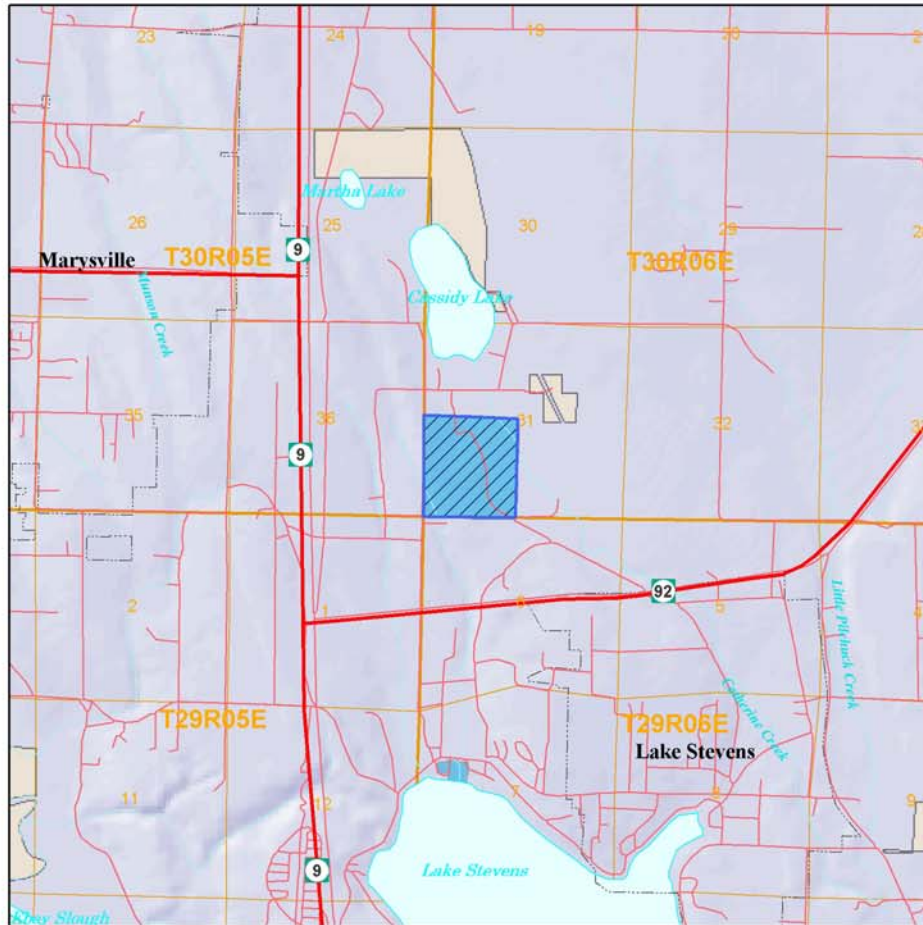
Hydrography

- Annual Stream or River
- Intermittent Stream
- Canal
- Shoreline
- Lake or Wide River

1:50,000

1 inch equals 0.79 miles

Figure 3. Corson Natural Area



Washington Department of Fish and Wildlife

- Corson Natural Area Wildlife Area Unit
 - Conservation Easement
 - WA Dept of Fish and Wildlife Owned Land
- Major Public Land Ownership**
- Federal Land
 - Other State Land
 - County Land
 - City Land
 - Tribal Land

Administrative Boundaries

- Township Line
- Section Line
- Shore Line
- County Line
- State Line
- International Border
- City or Town Limits

Transportation Network

- Interstate Highway
- US Highway
- State Route
- Secondary Road
- Trail

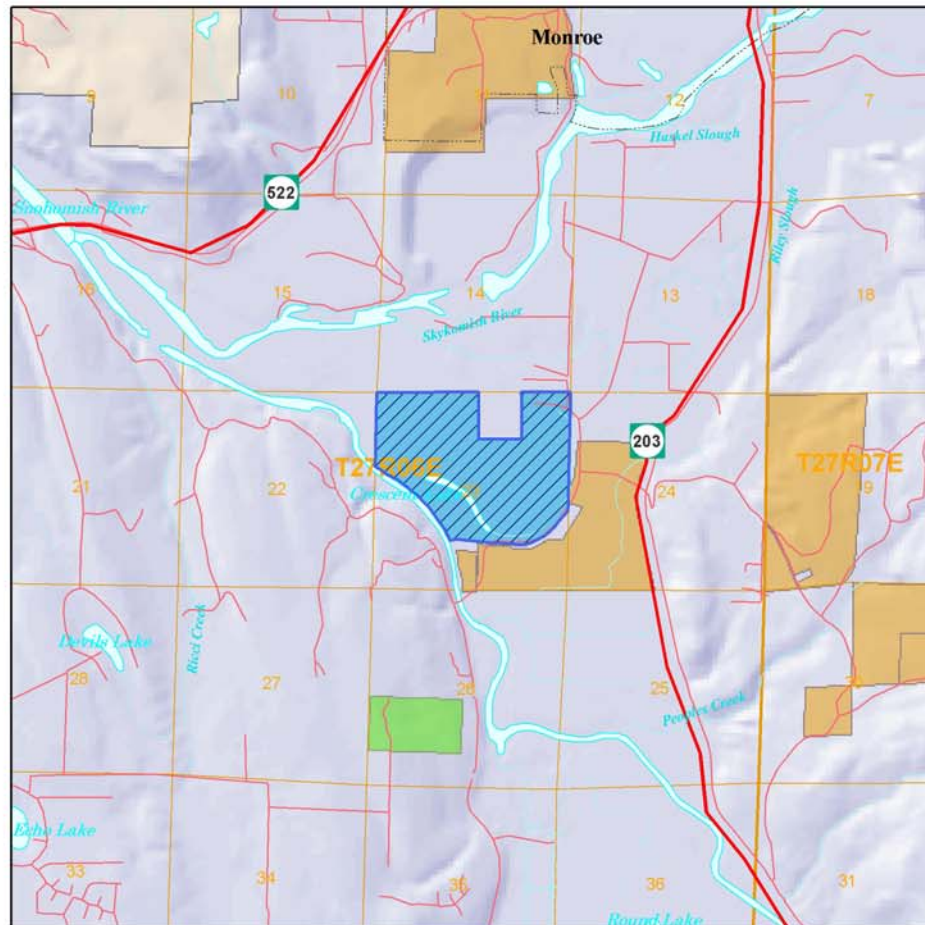
Hydrography

- Annual Stream or River
- Intermittent Stream
- Canal
- Shoreline
- Lake or Wide River

1:50,000

1 inch equals 0.79 miles

Figure 4. Crescent Lake Unit



**Washington Department of
Fish and Wildlife**

Crescent Lake Wildlife Area Unit

Conservation Easement

WA Dept of Fish and Wildlife Owned Land

Major Public Land Ownership

Federal Land

Other State Land

County Land

City Land

Tribal Land

**Administrative
Boundaries**

Township Line

Section Line

Shore Line

County Line

State Line

International Border

City or Town Limits

Transportation Network

Interstate Highway

US Highway

State Route

Secondary Road

Trail

Hydrography

Annual Stream or River

Intermittent Stream

Canal

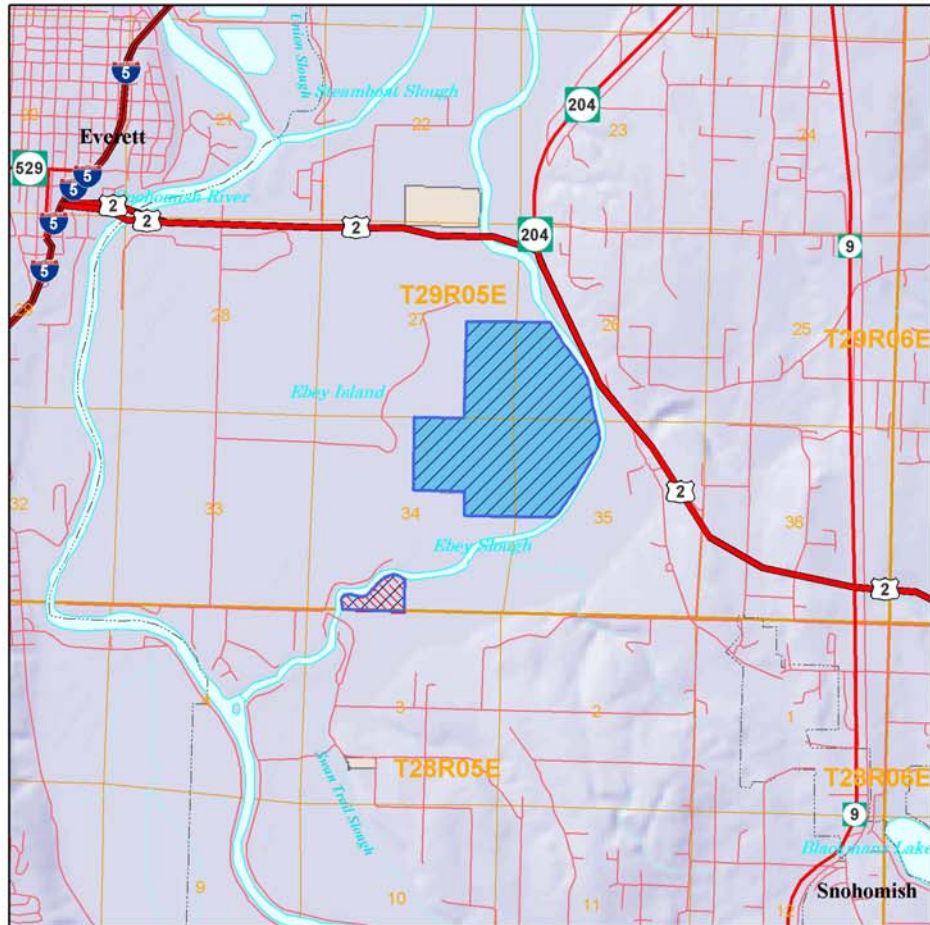
Shoreline

Lake or Wide River

1:50,000

1 inch equals 0.79 miles

Figure 5. Ebey Island Unit



Washington Department of Fish and Wildlife

Ebey Island Wildlife Area Unit

Conservation Easement

WA Dept of Fish and Wildlife Owned Land

Major Public Land Ownership

Federal Land

Other State Land

County Land

City Land

Tribal Land

Administrative Boundaries

Township Line

Section Line

Shore Line

County Line

State Line

International Border

City or Town Limits

Transportation Network

Interstate Highway

US Highway

State Route

Secondary Road

Trail

Hydrography

Annual Stream or River

Intermittent Stream

Canal

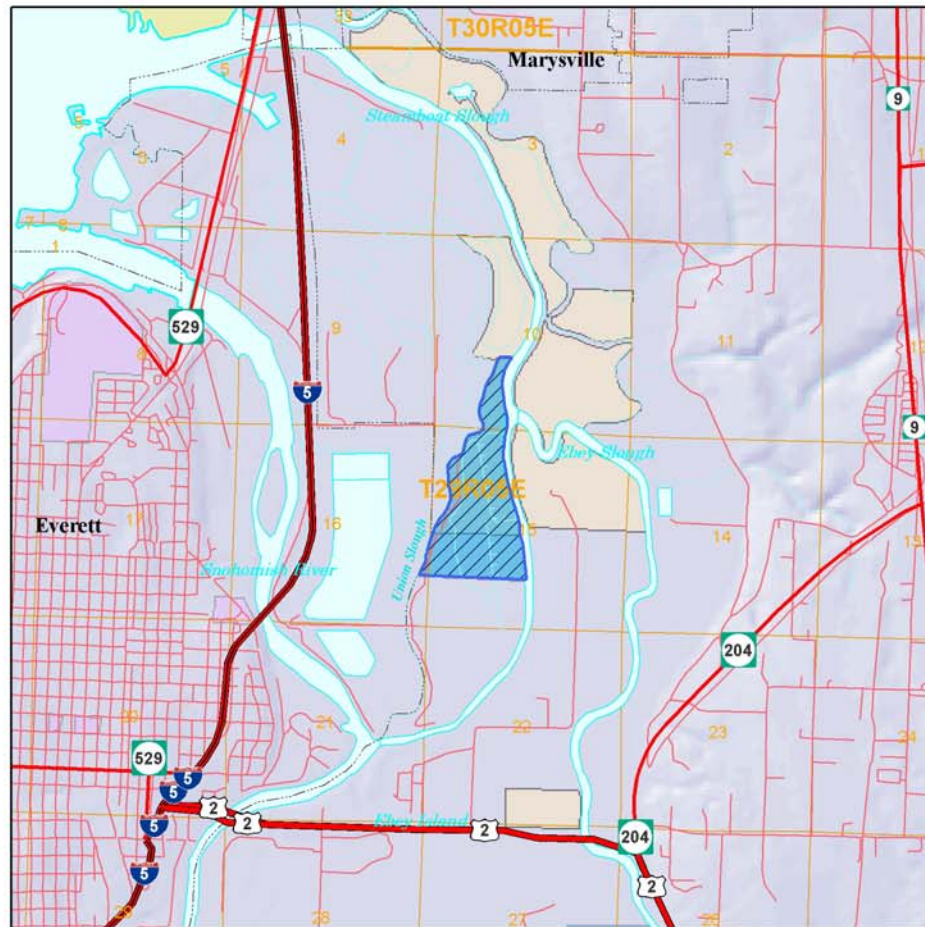
Shoreline

Lake or Wide River

1:50,000

1 inch equals 0.79 miles

Figure 6. Spencer Island Unit



Washington Department of Fish and Wildlife

Spencer Island Wildlife Area Unit

Conservation Easement

WA Dept of Fish and Wildlife Owned Land

Major Public Land Ownership

Federal Land

Other State Land

County Land

City Land

Tribal Land

Administrative Boundaries

Township Line

Section Line

Shore Line

County Line

State Line

International Border

City or Town Limits

Transportation Network

Interstate Highway

US Highway

State Route

Secondary Road

Trail

Hydrography

Annual Stream or River

Intermittent Stream

Canal

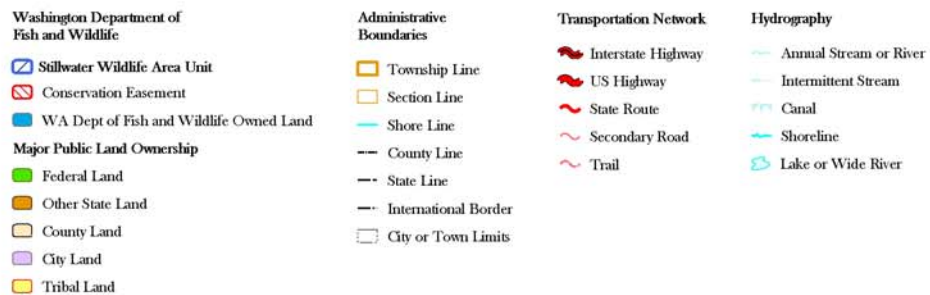
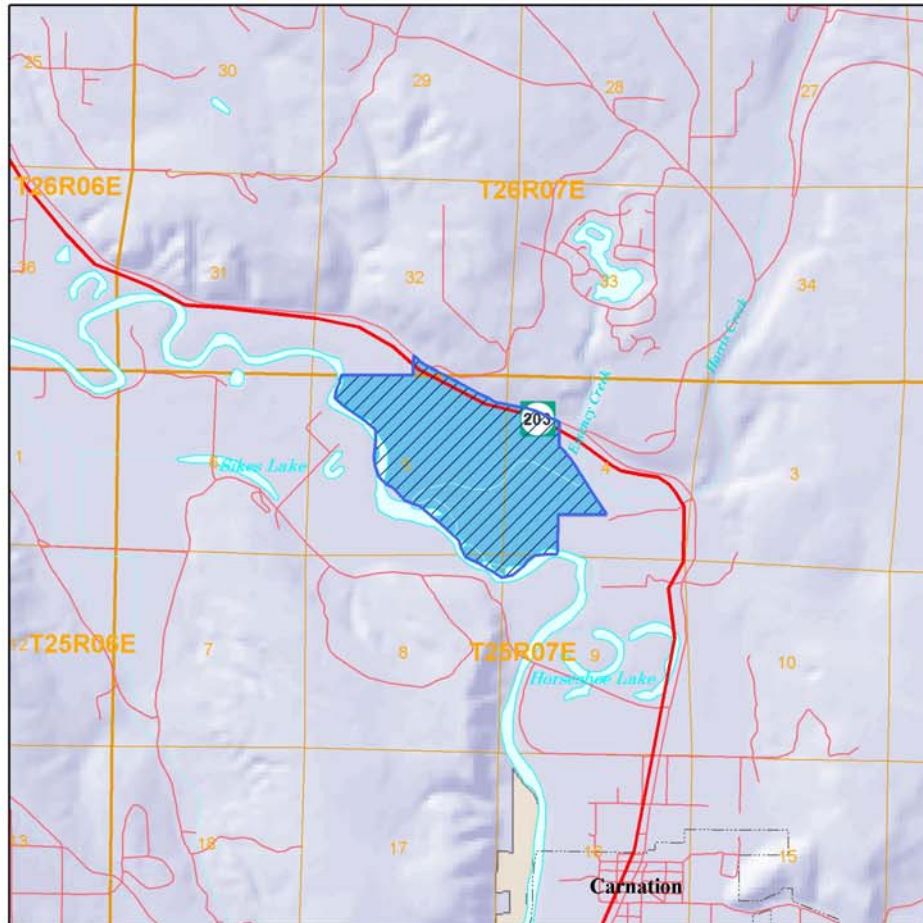
Shoreline

Lake or Wide River

1:50,000

1 inch equals 0.79 miles

Figure 7. Stillwater Unit



1:50,000
1 inch equals 0.79 miles

2.2 Purchase History, Purpose and Current Use

The primary reason for purchasing the Snoqualmie Wildlife Area parcels was to preserve and enhance natural stream drainages, floodplain wetland habitat and provide opportunities for hunting, dog training and nature observation (Table 4). Prior to European settlement, the Snoqualmie River valley contained large open water marshes ringed with willow and was seasonally utilized by waterfowl. Attempts had been made to clear, drain and dike much of the valley for dairy, crop or pasture farming—with variable success.

Acquisitions for the Snoqualmie Wildlife Area occurred between 1964 and 1989, beginning with the Ebey Island property. Four parcels were added in the 1970s, and the Spencer Island Unit was purchased most recently, in 1989. Most purchases were made with a combination of WDFW funds, Washington (state) Interagency Committee for Outdoor Recreation funds, State Duck Stamp monies and (federal) Bureau of Outdoor Recreation funds.

Flooding is common in all the units, especially during the rainy winter months. Undeveloped river floodplains and their associated shrub and forested wetlands are increasingly rare in western Washington. WDFW ownership ensures their protection and wise management while offering the public various recreational opportunities.

The recent federal listing as threatened of chinook salmon in the Snoqualmie and Snohomish watersheds has shifted the Wildlife Area's priority towards salmon habitat recovery and restoration. Spencer Island and Ebey Island are within the zone of tidal influence, which have the potential to provide value habitat for the lifecycle needs of many salmonid species.

Many conservation organizations, both governmental and non-governmental, are active within Snohomish and King counties. Many of the units of the Snoqualmie Wildlife Area are near other public and private conservation land holdings. Developing communication with these organizations about planning efforts and restoration and recovery projects offers an opportunity to coordinate and improve habitat quality and management on a much larger land base. The acquisition on Spencer Island in particular was critical to minimize habitat fragmentation, and in conjunction with other government ownerships, has allowed implementing a coordinated management strategy throughout much of the lower watershed.

Table 4. Purchase History and Purpose

Unit Name	Year	Purpose	Funding
Cherry Valley	1974	Hunt, fish, and train dogs	WDFW, Bureau of Outdoor Recreation, Interagency Committee for Outdoor Recreation
Corson Natural Area	1976	Wildlife viewing enhancement	Gifted
Crescent Lake	1974	Hunt, fish, and train dogs	WDFW, Bureau of Outdoor Recreation, Interagency Committee for Outdoor Recreation
Ebey Island	1964	Hunt and fish	WDFW, Bureau of Outdoor Recreation, Interagency Committee for Outdoor Recreation
Spencer Island	1989	Hunt, waterfowl nesting	WDFW, State Duck Stamp
Stillwater	1970, 1971, 1974	Hunt, fish, and train dogs	WDFW, Bureau of Outdoor Recreation, Interagency Committee for Outdoor Recreation

Cherry Valley Unit

The Cherry Valley Unit is 386 acres of forest and grassland in the Snoqualmie River floodplain, one mile north of Duvall. Carnation Farms originally purchased the land in 1908 and converted it to dairy farming. About 7.5 miles of natural stream courses were diverted into straightened ditches emptying into Cherry Creek and a dike was built along Cherry Creek, tributary to the Snoqualmie River. (The dike and main collector ditches belong to King County Dike and Drainage District #7; 56 percent of the district is WDFW land.) Even after the land was cleared, ditched and diked in the 1920s, it was marginal pastureland for cattle and horses due to its wetland condition throughout the year. Under WDFW management the property, bought in 1975, was farmed until the mid-1980s, when it was leased to local farmers to cut silage and graze cattle until 2001.

Today this unit includes approximately 100 acres of deciduous and coniferous forest (70 acres in swamp, 30 acres in upland hillside); the remainder is fields of primarily reed canary grass, 15 small man-made ponds (from one-fourth to two acres in size) and about two miles of hedgerows. This is one of the lowest points in the Snoqualmie River valley. From mid-November to April, flooding is common; eight feet is typical but depths of 20 feet have been recorded. Currently, a cooperative project is being proposed with Washington Trout and Ducks Unlimited that would restore Cherry Creek and its wetland habitat for salmon, trout and waterfowl.

This unit contains a large barn on high ground (west of Cherry Valley Road) that serves as office, shop and storage area, as well as a large pheasant pen with covered loading area, a pump house and small outbuilding. There are 19 footbridges that cross the ditches and streams, and three parking areas with reader boards. Several fences border the unit and are in various need of repair. Recreational uses here include hunting pheasant and waterfowl, recreational and organized dog training and trials, fishing, nature observation, jogging, and picking berries and mushrooms. Pheasant hunting and dog trials and training are the most popular uses of this site.

Corson Natural Area

The Corson Natural Area is 160 acres of western Washington bottomland just north of Lake Stevens in a rural residential area. This unit was last logged and cleared in the 1950s. The

previous owner built a one-acre and an eight-acre pond, and maintained about seven acres of clearings, which are still present today. The remainder is second growth forest of mixed deciduous/coniferous tree with red alder. Catherine Creek cuts through the northeastern corner of this unit.

In the last 15 years, volunteer groups have cleared the alder trees and brush to plant about eight acres of coniferous trees. A contract farmer planted the seven acre field in barley for wildlife use. In 2004, Williams Pipeline Company placed a natural gas pipeline along the southern edge of the property. A large portion of the cleared area was replanted with native shrubs and trees in March 2005 with the help of WDFW employees, a Washington Conservation Corps crew and volunteers. At present there is a trail, one observation blind, but no developed public access to the property. This unit has been used by a variety of local conservation organization for environmental education outings and field trips.

This unit was gifted to WDFW in 1976 for non-consumptive wildlife enhancement and public enjoyment. The gift deed required vegetative manipulation to enhance wildlife habitat and to provide public enjoyment of these resources. Hunting is not allowed.

Crescent Lake Unit

The Crescent Lake Unit contains 360 acres of forest, swamp and farmed fields and is located three miles south of Monroe. The area, logged around the turn of the century, was historically a dairy hay/silage operation until the early 1960s. The land was purchased by WDFW in 1974 to provide public land for hunting (waterfowl and pheasant) and other wildlife oriented recreation. Crescent Lake itself is a 10-acre oxbow lake that was once part of the Skykomish River. Riley Creek runs through another former river channel and enters into the Snoqualmie River near the northwest corner of this property. There is also a 25-acre marsh on this unit.

In the 1970s and 1980s, small openings and connecting trails were created in the forest to provide edge habitat and areas for hiking and nature observation. Currently about 215 acres are deciduous woodland; the remaining 110 acres are farmed through sharecropper agreements that leave some cereal grains standing for wintering waterfowl. There are also about two miles of mowed trails that wind along the lake and Riley Creek. A 200-foot long footbridge, built across the lake in 1978 – completes the loop. There is a gravel parking area with reader boards at the north and south ends of the property. Recreational uses here include hunting pheasant and waterfowl, along with walking, nature observation and some fishing.

The neighboring property (approx. 140 acres) formerly called the Honor Farm, which was owned by the Department of Corrections, was available for public hunting until recently. This property is now owned by the Tulalip Tribe that is developing a management plan for this property, which includes the building of a bio-digester on this property. WDFW will coordinate with the Tribe during their planning process.

Ebey Island Natural Area

This unit consists of two parcels located downstream of Spencer Island between Everett and Snohomish. They were acquired in 1964 for county back taxes. The larger parcel (417 acres) was logged in the 1890s, while the smaller piece (3.5 acres) had been diked and drained for cattle

grazing. Today the smaller parcel is grassland, and the larger acreage has become reforested naturally into one of the few remaining Sitka spruce swamps on the Snohomish River estuary. This unit is protected by a dike, but can be overtopped with a five-year flood. Some habitat manipulations occurred when Dike and Drainage District #1 realigned the borrow ditch for the dike. The ditch was widened (in some places by 120 feet), providing some open water habitat for waterfowl. A variety of wildlife uses this site. There is no legal access to either parcel—they are landlocked on three sides by private ownership and the Dike District owns the dike on the slough side. Because of the lack of (public) access, very little active management occurs on this site.

Spencer Island

This is a 412-acre island (WDFW owns 175 acres and Snohomish County Parks owns 240 acres) in the Snohomish River estuary just east of Everett. Diked and cleared by the 1930s, the landowners grew oats and barley, planted a plum orchard and grazed cattle. The island is a flat, grassy marsh/scrub-shrub wetland complex ringed by mixed, mainly deciduous, forest. Prior to dike construction, it was a tidally flooded wetland. From 1969 to 1978, the earthen dike encircling the island was built higher (averaging ten feet tall) and wider by hauling in thousands of yards of large wood chips, called hog fuel. A wide slough that cut across the center of the island was also filled. The northern tip of the island (about 23 acres) was only partially diked at the time and remained tidally influenced.

In 1989, the Snohomish County Parks and Recreation Department and WDFW jointly acquired the island for wetland and waterfowl habitat preservation. WDFW owns 175 acres on the north end (for waterfowl habitat), which consists of approximately 50 acres of mixed coniferous/deciduous forest; the remainder is mostly reed canary grass and cattails. A memorandum of understanding has been developed with the Parks Department to co-manage the island. This is an important agreement for hunter access, as several hundred yards of the County Park's land must be crossed to get to the WDFW-owned property.

Fifty acres of tidally influenced estuary on the south end of the island have been restored for salmon species in the past few years. In winter 2004, a breach developed on the WDFW property, on the northeastern side of the island, due to a failed dike. Currently a proposal to restore 150 acres of the island to intertidal estuary for salmon, waterfowl and other estuary-dependent species is moving forward in partnership with Ducks Unlimited and funded by Salmon Recovery Funding Board (SRFB). There is also a separate proposal to enhance public trails, hunting blinds and access for people with disabilities.

Parking and access to the area are through the City of Everett's sewage treatment plant on 4th Avenue. Main recreational uses here are waterfowl hunting, nature observation, dog walking, hiking and jogging.

Stillwater Unit

This 456-acre unit is three miles north of the town of Carnation, is the largest unit and hosts the greatest diversity of habitats. It was logged and cleared in the 1920s. It was purchased in 1970 to provide hunting opportunities and other wildlife-oriented recreation. The WDFW created a network of fields ranging in size from 20 to 40 acres, ringed with brushy drainages and hedgerows. Until 1998, the major fields were planted with corn, millet or barley to enhance wildlife habitat. The agriculture program was discontinued due to increased cost and the general decline of farming

activity in the valley. Much of the work at Stillwater was performed by sharecrop and contract farming agreements. Seasonal flooding is common and can inundate 20 to 70 percent of the unit property.

Stillwater has three small oxbow lakes (totaling about three acres) two that are connected to Harris Creek during high flow events and one that is a separate drainage. Harris Creek runs through the center of the property for approximately 10,500 feet before emptying into the Snoqualmie River. There are two unnamed ephemeral drainages on the property. This unit also has 8,500 feet of river shoreline. An abandoned railroad trestle and a footbridge cross Harris Creek. This unit is also being examined for its potential to restore wetland habitat and to remove fish passage barriers. Possible partners include the Cascade Land Conservancy, Ducks Unlimited and King County.

The major uses here are waterfowl and pheasant hunting, fishing, dog training and nature observation, as well as some swimming and picnicking along the river. A King County Parks and Recreation Department bicycle/walking/running trail skirts the unit's eastern boundary for three-fourths of a mile. There are two parking areas a mile apart adjacent to Hwy 203 with reader boards.

2.3 Ownership and Use of Adjacent Lands

Adjacent lands are mainly rural residential, agricultural and parks. The private agricultural landowners abutting these properties have their land in corn, pasture, and flowers, vegetables or dairy cattle in feedlots. Dike and Drainage District #1 owns land adjacent to the Ebey Island Unit, and the Snohomish County Parks and Recreation Department owns the southern two-thirds of the Spencer Island Unit, co-managing the entire island with WDFW. The Tulalip Tribe owns 145 acres adjacent to the Crescent Lake Unit (formerly called the Honor Farm), and has allowed access to hunters in the past. Currently, the tribe is pursuing building a bio-digester plant and considering other habitat restoration and enhancement opportunities on this property.

Most of the public shorelines not owned by WDFW belong to the Washington Department of Natural Resources or the U.S. Bureau of Land Management. These agencies manage this land for natural resource protection, and each has objectives for habitat condition, wildlife management and salmonid recovery.

To the West, Interstate 5 runs north and south through densely urban population centers in south Snohomish and King counties. In straight-line distances, Corson, Spencer Island and Ebey Island units are two to five miles east of the interstate. Everett is the largest nearby city (population 96,840). Stillwater and Cherry Valley Units are both less than 35 miles from Seattle, with the closest towns being Carnation (population 1,595) and Duvall (population 5,545) respectively. Moving northward from Cherry Valley on Hwy 203 is the Crescent Lake unit is near Monroe (population 15,480). Approximately 40 percent (2.4 million) of the state's population lives within a 60-mile radius of these units (in King and Snohomish counties).

The Snohomish River Watershed (includes the Snoqualmie River) is changing from the more traditional industries of forestry and agriculture to more urban uses. Local economies today include aerospace, high-tech and biotech industries, government, services and retail trade businesses along with some agriculture, forestry and mining. Human population in this watershed

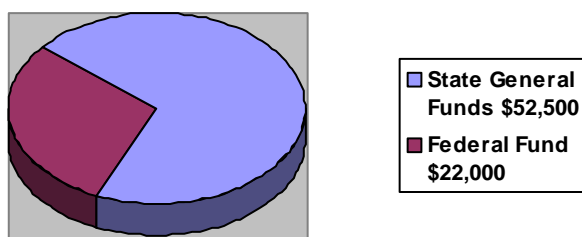
is projected to increase by 59 percent from 311,224 in 2000 to 528,293 in 2030 (Snohomish Basin Salmon Recovery Forum 2005).

In the Snoqualmie River Watershed between 1980 and 1999, the population nearly doubled from just fewer than 20,000 to about 38,000 residents. The units bordering the Snoqualmie River remain some of the last undeveloped areas for outdoor recreation in highly urbanized King and Snohomish Counties. Fishing is a major activity, and the Wildlife Area and nearby valley are among the most heavily hunted pheasant and dog training areas in western Washington. A national hunting and fishing survey compiled by U.S. Fish and Wildlife from 2001 indicated that 47% of Washington residents participate in wildlife watching, while only 16% fish and 5% hunt (WDFW 2005). In some locations the public involved in wildlife associated recreation far outnumber hunters and anglers—hiking, dog training and walking, bird watching, photography, and boating are the major non-consumptive recreational uses on this Wildlife Area.

2.4 Funding

Operating funds to manage the Snoqualmie Wildlife Area come from two main sources: Federal Aid in Wildlife Restoration (Pittman-Robertson) funds, and state general funds. State general funds provide a 25 percent match for Federal Aid dollars. The current one-year budget (July 1, 2005 to June 31, 2006) includes \$22,000 in Federal Aid funds, and \$52,500 in state general funds (Figure 3). This \$74,500 supports all operations and maintenance, including staff salaries on the Wildlife Area. State Duck Stamp funds have been used for special projects, such as waterfowl habitat enhancements on Spencer Island but there are no projects funded currently. Ducks Unlimited is spending Salmon Recovery Funding Board funds and North American Wetland Conservation Act funds on a habitat restoration project on Spencer Island.

Figure 3. Snoqualmie Wildlife Area Funding Sources



Portions of three staff positions are supported (as part of the Skagit/Snoqualmie Wildlife Area Complex) including:

- 1.0 FTE Wildlife Area Manager (Fish and Wildlife biologist 3)
- 1.0 FTE Assistant Wildlife Area Manager (Fish and Wildlife biologist 2)
- 1.0 FTE Natural Resources Tech 2

The WDFW will, as part of the implementation of this plan, submit grant proposals and applications and identify other strategies to address unfunded management needs on the wildlife area.

2.5 Climate

Dominated by the presence of the Pacific Ocean and Puget Sound, the Snoqualmie Wildlife Area's climate is classified as marine west coast. The climate of area has moderate temperatures (mild winters and cool summers), and heavy rainfall during the winter. Western Washington precipitation is influenced by proximity to the Cascade Mountains. For every mile traveled east to the Cascade Range from Puget Sound, precipitation increases by an inch as the clouds drop their moisture load to rise above this barrier.

Temperatures range from an average of 42 degrees F in winter to 60 degrees F in summer, with highs rarely exceeding 85 degrees F and lows seldom below freezing. Average annual precipitation varies from about 35 inches at Spencer Island, Ebey Island and Corson units to 40 inches at Crescent Lake, Cherry Valley and Stillwater units, falling mainly between October and March. Snowfall also varies in relation to the Cascade Range, averaging about 1.5 inches annually, usually melting within 36 hours. Fog in the valley is common year-round, and usually burns off before noon.

2.6 Soils and Geology

This Wildlife Area sits in the Puget Trough Province. In the wake of the Vashon glacier's advance and retreat through the Puget Sound basin, gently undulating and lake-flecked land that is now Snohomish and King counties was formed. Soils had been scraped and compacted to clay, rock debris of all sizes was deposited, and the glacier's heavy melt waters created the sinuous Snoqualmie and Snohomish river channels and their network of tributaries. The broad, low-gradient valley was created by sub-glacial fluvial erosion (Booth 1994).

General elevations range from 75 to 400 feet above sea level, with a few higher hills topping 500 feet above sea level. The river elevation and associated meander belt is higher in elevation than the surrounding valley floor in portions of the Snoqualmie River valley (Collins and Sheikh 2002). This is presumed to result from building sediment deposited by the Snoqualmie River channel throughout the post-glacial (Holocene) period. Flood events deposited sediments near the channel but were not so large to distribute sediments throughout the floodplain. As a consequence, extensive areas along the valley margins are lower than the zone along the riverbank by typically six to nine feet.

Glacial soil deposits range from very porous gravels and sands to hard till in which substantial clay and silt are mixed with coarser particles. As a result, several Soil series occur on the Snoqualmie Wildlife Area due to their wide distribution throughout the floodplain (Table 5).

Table 5. Soils of the Snoqualmie Wildlife Area*(Developed from Synder et al. 1973 and Debose and Klungland 1983)*

Soil Series	Cherry Valley	Corson	Crescent Lake	Ebey Island	Spencer Island	Stillwater
Alderwood	X					
Mukilteo				X		
Nooksack						X
Oridia						X
Pastik		X				
Pilchuck			X			
Puget	X		X	X	X	X
Puyallup	X			X		
Renton	X					
River wash						X
Seattle	X					
Snohomish	X			X	X	
Sultan	X		X			
Tokul		X				

The most common soils are poorly drained silt loams that formed in alluvium in small river valley depressions. Slopes here are less than one percent and elevations range from 10 to 650 feet. Permeability is slow to moderate with a high seasonal water table at or near the surface. Available water holding capacity is high and runoff is slow to ponded, with only a slight erosion hazard. However, the stream overflow hazard is severe. Below some of this soil is a black mucky peat about ten inches thick.

Secondary soils consist of silt or sandy loam, moderately well to rapidly drained, that are also formed in alluvium. Typically found as gently rolling bottomland or natural levees adjacent to streams, elevations here range from about sea level to 85 feet. Available water capacity is moderately high, runoff is slow and erosion hazard is slight.

2.7 Hydrology and Watersheds

The Snohomish Watershed includes the Skykomish and Snoqualmie rivers, which join to form the Snohomish River. Encompassing 1,856 square miles, the Snohomish River Watershed is the second largest basin that drains to Puget Sound, after the Skagit River. The Skykomish and Snoqualmie rivers originate in steep, confined valleys in the Cascade Mountains, while the Snohomish River flows through a broad alluvial valley and a multi-threaded delta for 21 miles on its way to Possession Sound. The Snohomish estuary itself (about nine miles long and two to four miles wide) encompasses almost 30 square miles and includes the Spencer Island and Ebey Island units.

Once the ground is saturated, a winter storm depositing an inch of rain in 24 hours can cause these rivers to rise six feet or more. If two storms move through consecutively, the rise can be more than 20 feet with severe flooding. While the average monthly river flows peak in December and January, the largest floods can occur from late October through January. Spring floods due to snowmelt and rain, can happen as late as July have a lower peak and last longer. In addition, the tides also significantly influence the Snohomish River for about 15 miles upstream, due to the

river's low gradient. High river flows combined with high tides can magnify the tidal effects in the estuary and lower portions of the stream.

While bank armoring and a lack of large woody debris have maintained the Snohomish River channel in a relatively straight pattern, several oxbow lakes indicate higher sinuosity at one time. A system of nearly continuous dikes along the banks and two major pump stations protect adjacent farmland from flood damage and disconnect the river from its floodplain. Prior to dike construction, the floodplain contained many seasonal wetlands and oxbows, with emergent, shrub-scrub, and forest vegetation. Today, behind dikes, much of this has become seasonally flooded agricultural land.

As the lower Snoqualmie River valley flattens out, the river meanders through the cities of Carnation and Duvall and fertile agricultural and rural lands. Many abandoned oxbow lakes indicate that this river historically migrated across the two-mile wide floodplain, and an extensive system of marshes (lower than the riverbanks) occupied nearly the entire valley at one time (Collins and Sheikh 2002). Current analysis shows that bank hardening, channeling of the river's main channel and lack of large woody debris in the river has stabilized the channel (Collins and Sheikh 2002). These factors would decrease diversity of channel habitat and function within those river segments. Due to rapid growth and significant changes in land use affecting the hydrology and water quality of the Snoqualmie River, the American Rivers organization designated it one of America's "10 most endangered rivers" in 2001. Although WDFW only has control of a small portion along the Snoqualmie River, opportunities exist to work in conjunction with other public and private landowners to improve hydrology and habitat and water quality on a larger scale.

2.8 Fire History

Three documented fires occurred on Spencer Island Unit of the Snoqualmie Wildlife Area. The dikes on Spencer Island are made of hog fuel (coarse wood chips), which is a highly flammable material that tends to smolder and burn slowly underground once ignited. Transporting fire-fighting equipment to the area by land or water can be problematic due to dike conditions so fire fighting must be done when conditions allow with hand tools. Therefore fires may smolder for some time before eventually burning out. The first fire that escaped to the dike, was initially set to burn the remains of a mobile home on the Island. Another dike fire (of unknown causes) in 1999 took two days to put out. A third dike fire at the north end of the Island (potentially from a discarded cigarette) burned some nearby alder trees and took nearly a month to extinguish.

2.9 Vegetation

The characteristic habitats of the Snoqualmie Wildlife Area—highly influenced by the presence of water—include open water, estuary, various types of wetlands, riparian areas, forested uplands, and seasonally flooded agricultural land.

Open water/estuary/wetlands

This Wildlife Area is approximately 33 percent open water/estuary/wetlands due to the low elevation of most of its units relative to adjacent major rivers, as well as their locations within the floodplain. Five of these units flood annually, and one is partially tidally influenced. Included in this category are emergent and shrub-scrub wetlands, brackish/freshwater intertidal marsh, forested swamps, ponds, lakes and streams. Plants found in these wet areas include reed canary grass,

cattail, hard-stemmed bulrush, soft rush, Lyngby's sedge and slough sedge. Related shrubs and trees include hardhack spirea, willows, Sitka spruce, crabapple, red alder, and western red cedar.

Forested land

Forests comprise approximately 30 percent of the Wildlife Area's total acreage, mainly on the Corson, Crescent Lake and Cherry Valley Units and along riparian corridors. Deciduous, coniferous and mixed lowland forests include coniferous trees such as Douglas fir, western hemlock, Sitka spruce, Western red cedar and shore pine; and deciduous trees including big leaf maple, red alder and black cottonwood. Typical forest-habitat shrubs are Indian plum, blackberry (Himalayan, Evergreen and Trailing), salmonberry, red huckleberry, vine maple and snowberry. Riparian corridors contain red alder, black cottonwood, big leaf maple, crabapple, willow and salmonberry. These stands of trees and shrubs provide escape and thermal cover, shade, and forage, nest, and perch sites for fish and wildlife.

Non-forested land

About 37 percent of the Snoqualmie Wildlife Area consists of seasonally flooded agricultural lands (originally wetlands some that have been diked and ditched) and uncultivated fields. These were planted with cereal grains and corn to provide winter food for waterfowl.. The uncultivated fields now contain Himalayan blackberry, reed canary grass and other invasive weeds with some woody species starting to encroach.

Invasive plant species

Plants introduced from other parts of the country or the world can sometimes present a threat to native flora and fauna. "Invasive species" are those that grow aggressively and can crowd out, out-compete, or exclude native species. They often spread rapidly and can dominate the landscape. Perhaps the most widespread threat to the Snoqualmie Wildlife Area is reed canary grass, which has formed thick monoculture stands throughout most of the wetlands that had been converted to pasture. Other invasive plants found on this Wildlife Area include Japanese knotweed (*Polygonum cuspidatum*), Himalayan and evergreen blackberry (*Rubus* spp.), purple loosestrife (*Lythrum salicaria*), butterfly bush (*Buddleia davidii*), and Scotch Broom (*Cytisus scoparius*). For more information concerning invasive species and how WDFW plans to control them, see the Weed Plan in Appendix B.

2.10 Important Habitats

The Washington Department of Fish and Wildlife identifies wetlands, riparian zones and rural natural open space as priority habitats due to important or unique features that significantly affect fish or wildlife populations. Research shows the extent of changes in the original wetland and forested areas along the Snoqualmie River valley. Compared to historic conditions in 1870, the forest cover in 2000 was only 16 percent, and the valley wetlands covered only 19 percent of their historic locations (Collins and Sheikh 2002). This means 84 percent of the historic forest and 81 percent of historic wetlands have been lost or converted to other uses. Like-wise, almost the entire Snohomish River 100-year floodplain was wetlands in 1885, but since then about 19,000 acres of estuary wetlands have been converted to agriculture, and 44 miles of levees have greatly changed the riverbanks in places (Pentec Environmental 1992). Fewer than ten percent of the original Snohomish estuary wetlands remain (Bortelson et al 1980).

Estuary/Wetlands

Estuaries have high fish and wildlife diversity in both number of species and individuals. They are important breeding habitat provide important seasonal habitat and movement corridors. Estuaries are highly vulnerable to alteration. Two Snoqualmie Wildlife Area units, Spencer and Ebey Islands are located in the Snohomish estuary, and Spencer Island is partially open to tidal influence. Estuaries provide important feeding and loafing habitat for a wide variety of waterfowl and shorebirds, and create excellent hunting grounds for birds of prey.

Estuary habitat restoration is a priority in WDFW efforts to improve habitat for salmon and other native fish species. Estuaries provide important habitat for anadromous fish species to transition from life in fresh to salt water. Reconnecting channels to tidal flows increases the available habitat for foraging salmon to improve their body condition and survival rate before reaching the ocean—a critical need for Chinook. These channels also provides summer and winter refuges that are rich in food for young salmon and are outside of the fast current, often silt-laden flow of the river.

Snoqualmie Wildlife Area's marshes, scrub-shrub wetlands and forested swamps provide essential fish and wildlife habitat as they contain a variety of vegetation types, open water, and forest structure for breeding, cover, and forage. These wetlands are also strategically located along the Pacific Flyway and provide essential feeding and loafing grounds for migrating ducks, geese, swans, shorebirds, songbirds, and marine fish, in addition to excellent foraging areas for bald eagles, peregrine falcons, and other birds of prey. The U.S. Fish and Wildlife Service listed the Snohomish River valley as the "highest priority for restoration projects in the Washington coastal region" because of its importance to wintering waterfowl (US Fish and Wildlife Service 1980).



Spencer Island Estuary/Wetland Habitat

All of these wetlands have been altered by a variety of human activities such as dike and ditch building, clearing, and farming. Most of them were used to grow silage or grain, and after going fallow (due to rising costs and shrinking budgets), were heavily invaded by invasive plants, such as reed canary grass. The Ebey Island unit Sitka spruce wetland is one of the few remaining forested wetlands in Snohomish County. The natural hydrology of this unit has been altered since it was isolated from the floodplain by dikes many years ago. So even though the native vegetation occurs on this site, the lack of hydrologic connectivity could impact the habitat quality and function on this site.

Riparian Areas

Areas adjacent to streams and rivers offer many important functions for fish and wildlife. Dense stands of trees and/or shrubs provide, escape and thermal cover; create stream channel features such as pools; maintain stream bank stability; and offer forage, nest and perch sites near water sources. Often these highly productive communities contain both plant and wildlife species that are endangered or threatened. The quality of riparian habitat impacts many aspects of water quality and therefore the quality of fish habitat.

Rural Natural Open Space

Natural open space is becoming rare, especially in highly urbanized King County, as development continues to expand eastward. Open spaces can provide breeding and foraging habitat, or act as a corridor linking other habitats. Even isolated parcels larger than ten acres are important as they still

provide some viable habitat function and can have high species density and diversity. However, they remain vulnerable to direct and indirect habitat alterations and human disturbance.

2.11 Fish and Wildlife Resources

Fish and wildlife diversity is a primary goal guiding the WDFW's management efforts. The various units comprising the Snoqualmie Wildlife Area contain a wide range of estuary/wetland and riparian-dependent aquatic and terrestrial species, as well as federally threatened bald eagles, and anadromous chinook salmon populations. Salmon and wildlife are important co-dependent components of regional biodiversity, and deserve far greater joint consideration in land-management planning, fishery management strategies, and ecological studies than they have received in the past.

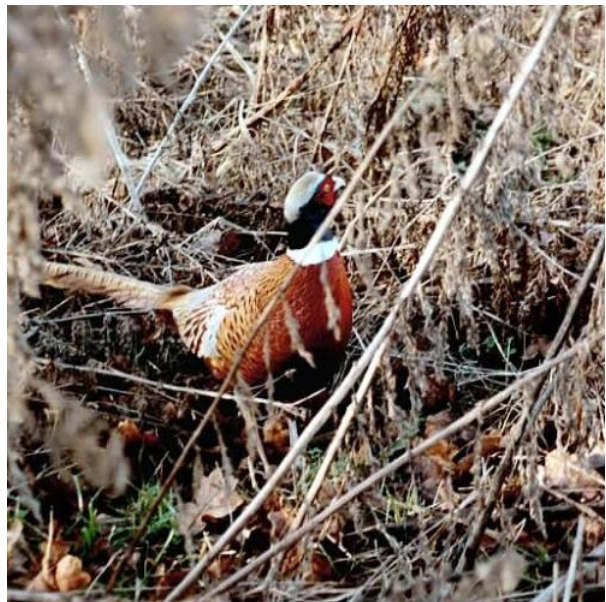
Birds

At least 211 species of birds have been observed in the Snohomish basin; these species range from many varieties of waterbirds such as heron, duck, geese, grebes and shorebirds to forest and grassland birds such as sparrows, warblers and wrens. The most heavily researched unit is Spencer Island, thanks to the local Pilchuck Audubon chapter. Some of the more interesting species recorded include sandhill cranes (Spencer Island unit), swans (Crescent Lake unit), ruffed grouse (Corson and Ebey Island units) and a large breeding population of wood ducks (Ebey Island unit) (Starkey et al 1980; US Fish and Wildlife Service, 1980). Sixty-two species of birds breed on one or more of the wildlife area units.

A variety of waterfowl use the Wildlife Area including dabbling and diving ducks, geese and a growing population of Tundra and Trumpeter swans that have been night roosting on the Crescent Lake unit in recent years. These units are used primarily as wintering and migratory sites; a few birds may breed locally.

Shorebirds, gulls, herons, coots, robins, sparrows, swallows, wrens and blackbirds are also common on the Wildlife Area. The density of waterfowl and shorebirds can attract raptors such as bald eagles, red-tailed hawks, rough-legged hawks, marsh hawks, various owls and an occasional peregrine falcon or merlin.

About 4,100 to 4,400 pheasants (2004-2005 years respectively) are released on portions of Cherry Valley, Crescent Lake and Stillwater units each fall. While an exotic species, WDFW releases pheasants on the wildlife area due to the popularity of pheasant hunting and to create an opportunity for Western Washington hunters. Following release, hunters harvest most of the pheasants and the remainders provide prey for hawks and coyotes. Table 7 shows the average upland bird and waterfowl hunter use in this and two neighboring counties for the past three hunting seasons.



Ring-necked Pheasant

Fish

Fish species found in the Snoqualmie Wildlife Area's intertidal and fresh water environments include Chinook salmon, coho salmon, chum salmon, pink salmon, steelhead, sea-run cutthroat trout, rainbow trout, perch, bass, whitefish, surf smelt, starry flounder, threespine stickleback, peamouth chub, staghorn and prickly sculpin, bluegill, pumpkinseed, brown bullhead and river lamprey.

The Snohomish basin supports the largest number of reproducing coho salmon between the Columbia River and Canada, producing 25 to 50 percent of the coho living in Puget Sound (Snohomish Basin Salmon Recovery Forum 2005). In addition, the Snoqualmie and Skykomish rivers are spawning grounds for two distinct, naturally occurring Chinook salmon populations. However, the loss of rearing habitat quantity and quality along the mainstems, within the Snohomish estuary, and in the nearshore environment is thought to be a key reason for their decline to less than ten percent of historic levels.

In-stream habitats for juvenile rearing are limited for all life history stages of salmon within the Snoqualmie and Snohomish watersheds. Low summer stream flows restrict the fish to deep-water portions of the stream, which may lack the necessary food and habitat resources necessary for the fish to survive. Agricultural, residential, and forestry land uses have contributed to poor water quality in the larger rivers and many tributaries, limiting the success of spawning adults and the rearing of juveniles of all species. The loss of wetlands and near-estuarine habitat is a limiting factor to anadromous production within the Puget Sound region. The introduction of exotic or non-native fish species in local lakes is detrimental to native fish populations, due to competition and predation.

Growing human populations in the Pacific Northwest have a variety of impacts salmon and trout habitat. Increased urban development has degraded water quality and wetland function in small streams, where the majority of salmon production occurred historically within the Snoqualmie and Snohomish watersheds. Stream modifications such as dikes, ditches and confined streams (channelized sections of river) impact water movement by changing the timing and delivery of water within the system. These changes modify wetland and floodplain processes and effectively reduce available and usable habitat for riverine and other wetland dependent species. The Wildlife area planning effort will identify opportunities to restore or enhance ecosystem function, to manage or preserve quality habitat by controlling exotic and invasive plants, which decrease habitat diversity.

Mammals

Although an extensive survey has not been conducted, research and personal communication with various specialists indicate that approximately 16 species of mammals live here. Mammals observed here include elk, black-tailed deer, coyote, raccoon, opossum, striped skunk, beaver, muskrat, river otter, long-tailed weasel, mink, cottontail rabbit, Townsend mole, deer mouse, shrews and other rodents.

Reptiles and amphibians

Reptiles and amphibians abound in these wet habitats. Species likely to occur include the garter snake, painted turtle, red-legged frog, Pacific tree frog, bullfrog, Northwest salamander, western

long-toed salamander, rough-skinned newt, and Western toad. A rare but potential occurrence may be the Pacific giant salamander in some limited habitat areas.

Special Species

These are species listed at the state level as Endangered, Threatened, Sensitive, or Candidate by the Washington Department of Fish and Wildlife, or listed (or proposed for listing) at the federal level by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service. The species listed in the table may occur on the wildlife area during some part of their life cycle such as foraging, loafing and a few may breed on these sites. For the Snoqualmie wildlife area, eight bird species, four fish species and one reptile species are either threatened, sensitive, species of concern or candidate species for listing at the state or federal level (Table 6). Species included in these categories are known to be experiencing, or have experienced, failing or declining populations due to factors such as limited numbers, disease, predation, exploitation, or a loss of suitable habitat.

2.12 Recreational Uses and Changing Trends

The Snoqualmie Valley provides variety of outdoor pursuits as more people move into the surrounding suburban-rural interface. Fishing is a major activity throughout the year. The King County hiking/biking trail that borders the Stillwater Unit is part of the Rails to Trails system. This trail system runs from the King/Snohomish County line up to Snoqualmie Pass and receives

Table 6. Listed Species on Snoqualmie Wildlife Area

Species	Federal Status	State Status*	Units
Bald eagle	Threatened	Threatened	All (foraging)
Merlin	---	Candidate	Spencer (foraging)
Peregrine falcon	Species of Concern	Sensitive	Spencer (foraging)
Pileated woodpecker	---	Candidate	Spencer, Ebey
Purple martin	---	Candidate	Spencer (foraging)
Vaux's swift	---	Candidate	Spencer (foraging)
Western grebe	---	Candidate	Spencer (rare slough)
Chinook salmon	Threatened	Candidate	(Major rivers)
Bull trout/Dolly varden	Threatened	Candidate	(Major rivers)
Coho salmon	Candidate	n/a	(Snoqualmie River)
Pacific lamprey	Species of Concern	n/a	(Major rivers)
Western toad	Species of Concern	Candidate	Unknown

**Definitions: Endangered = any species native to the state of Washington that is seriously threatened with extinction throughout all or a significant portion of its range within the state. Threatened = any species native to the state of Washington that is likely to become an endangered species within the foreseeable future throughout a significant portion of its range within the state without cooperative management or removal of threats. Sensitive = any species native to the state of Washington that is vulnerable or declining and is likely to become endangered or threatened throughout a significant portion of its range within the state without cooperative management or removal of threats. Candidate = species that the WDFW will review for possible listing if sufficient evidence suggests that its status may meet the listing criteria defined for State Endangered, Threatened, or Sensitive.*

about 25,000 visitors a year. Hiking, bird watching, dog walking, dog training, jogging, and nature photography are common activities on the wildlife area.

In the 1970s, hunting and fishing were the main activities in 4 of the 6 units. By 1990, deer hunting had decreased greatly, while pheasant and rabbit hunting increased. Waterfowl hunting has seen a number of declines and increases over the decades that seem to mirror the changing populations of ducks and geese that migrate through here each year and the aging population of many hunters.

Over the past thirty years, changes have occurred in how the public uses this Wildlife Area. Table 7 shows various user groups and their estimated frequency of use on this Wildlife Area over time. Visual observations, vehicle tallies, and various license and harvest data have been used to create this table.

The Cherry Valley, Crescent Lake and Stillwater units continue to be actively managed for waterfowl and pheasant hunting. Pheasant hunting is a popular activity with birds released four times weekly during the pheasant season. About 4,100 to 4,400 pheasants (2004-2005 releases respectively) are released annually on portions of Cherry Valley; Crescent Lake, and Stillwater units each fall. Very few birds survive predation and the stress of the winter months. Hunting released pheasants is done exclusively on the WDFW's wildlife areas, waterfowl hunting also occurs on private and federal lands.

As the human population of nearby towns and cities increased, passive recreational use has increased. Since 1980, non-consumptive uses are increasing on many units, spurring the possibility of regulations to deal with conflicting uses and/or overcrowding, especially on weekends and in the fall during the hunting season. Bird watching has significantly increased in

Table 7. Snoqualmie Wildlife Area Users and Frequency

Type of Use	Year Started	User Days* 10 yrs ago	User Days* In 2005	Trend in Use
<i>Consumptive uses</i>				
Fishing	1970s	500	1,000	Increasing
Pheasant hunting	1970s	12,500	10,800	Decreasing
Waterfowl hunting	1970s	11,600	13,000	Increasing
Deer hunting	1970s	3,000	1,500	Decreasing
Rabbit hunting	1970s	650	700	Increasing
Trapping	1970s	250	0	Decreasing
<i>Nonconsumptive uses</i>				
Walking	1990s	2,500	4,000	Increasing
Dog training/walking	1970s	5,500	7,000	Increasing
Parking/Rest stop	1980s	3,500	5,500	Increasing
Nature observation	1980s	250	500	Increasing

**This is the number of users multiplied by the number of days on site*

the past ten years, thanks to several active local Audubon Society chapters. There is concern that dog walking (not training) on wildlife areas have increased but there is currently no data to quantify this activity.

Educational and recreational facilities on the Snoqualmie Wildlife Area include eight parking areas, eight informational reader boards, and an ADA accessible wildlife viewing/hunting blind. An interpretive shelter built in 1978 was short lived, after vandals destroyed the roof within two months, it was permanently dismantled.

WDFW staff spends much time balancing the needs of the various wildlife area users and local landowners, through habitat enhancement, trail maintenance, and use regulations designed to avoid conflicts between user groups and improve safety on this popular wildlife area.

CHAPTER III. MANAGEMENT OBJECTIVES, ISSUES AND STRATEGIES

Statewide goals and objectives listed in Chapter One shape management priorities on wildlife areas. Specific wildlife area information including why various units were purchased, habitat conditions, species present, and public issues and concerns are evaluated to identify wildlife area activities or strategies. The strategies and priorities for management will change on the Snoqualmie Wildlife Area as the status of species and habitats change and as new information and science emerge. Those changes may affect public use and other activities in the future. Therefore, achieving some of the objectives listed below will may alter, reduce or eliminate some current activities on some units.

Strategies are arranged annually in priority order and will change over time. Underlined strategies indicate no current funding. *Comments in italics are from the Citizen Advisory Group.* Public issues, questions and comments from past planning efforts, as well as meeting summaries with the District Team and the Citizens Advisory Group are captured in Appendix A.

Agency Objective: Ensure WDFW Activities, Programs, Facilities and Lands are Consistent with Local, State and Federal Regulations that Protect and Recover Fish, Wildlife and Their Habitats.

1. Manage species and habitats in compliance with the Federal Endangered Species Act

Since federal law requires the protection and management of threatened and endangered species until their populations have fully recovered, this is one of the Department's top management priorities. The Snoqualmie Wildlife Area is home to one federally threatened species, Chinook salmon and one species of concern, coho salmon.

The Snohomish River Estuary is nine miles long, two to four miles wide, and encompasses almost 30 square miles. It includes the Ebey and Spencer Island units. According to the Snohomish River Basin Salmon Recovery Forum (2005), approximately 85 percent of the historic marsh downstream of Ebey Slough has been disconnected by tidegates and dikes, while 82 percent of off-channel sloughs and ponds (994 acres) are also disconnected. Estuaries (where freshwater and saltwater mix) provide critical habitat for a wide variety of fish and wildlife, and many fish species, most notably juvenile salmon and ocean-going trout. Of the salmonid, Chinook are the most dependent on estuarine rearing habitat. The biological change these salmon and trout must undergo to survive in fresh and saltwater is immense. Estuaries and river deltas are the transition zone that enables this change to occur. They are also a rich source of food, provide places to hide from predators, give young salmon a safe harbor to grow strong for their ocean migrations, and are a key part of the migratory corridor salmon use to travel in and out of the rivers. While estuaries are important nursery habitats for juvenile salmon, they are essential for the survival of especially Chinook salmon

Two distinct, naturally spawning Chinook salmon populations exist in the Snohomish River basin; both are at less than ten percent of historic levels. The loss of rearing habitat quantity and quality along river main channels, within the estuary, and in the nearshore environment is thought to be one key reason for the decline of Snohomish River basin Chinook salmon. As a result, Puget Sound Chinook salmon were listed as threatened in 1999 by the Endangered Species Act (64 Federal Register 14308, March 24 1999).

The long-term recovery goal is to achieve self-sustaining levels of Puget Sound Chinook salmon numbers, distribution and diversity. To do that, the Shared Strategy for Puget Sound was formed. This is a voluntary, collaborative process involving federal, state, tribal and local governments, business representatives, the agricultural and forestry industries, conservation and environmental groups along with the local watershed planning areas to develop technically sound solutions that communities can embrace.

Under the Endangered Species Act, a recovery plan must contain quantitative recovery criteria and goals; identified threats to survival; site-specific management strategies and actions necessary to address the threats; estimated costs of the actions, and a schedule for implementation. A monitoring and adaptive management program should also be included.

The Puget Sound Salmon Recovery Plan calls for a combination of protection and restoration actions (from the citizen to the federal level), as well as integrated harvest, hatchery and habitat management approaches. It includes 14 separate watershed level plans, such as the Snohomish River Basin Salmon Conservation Plan. In the face of increased human population growth (projected at 1.4 million people in this state by 2020) and the impact of ongoing land use activities, the ability to recover Chinook salmon can only occur through a combination of habitat restoration and protection.

Actions that improve rearing habitat complexity and connectivity near and downstream from Chinook spawning areas, nearshore and estuary environments are predicted to be most effective in improving core Chinook population performance. Examples of floodplain restorations include levee setbacks, dike breaching and other restoration actions that will reconnect these nourishing habitats and by replicating the natural hydrological functions of a floodplain, will also help control flooding. Examples of estuarine restoration include reconnecting large blind tidal channels and sloughs isolated behind dikes, and improving connectivity between channels, sloughs, and marshes that provide rearing habitat for juvenile salmon, filter water, and absorb flood level flows.

Coho salmon in the Puget Sound region are designated as species of concern under the Endangered Species Act, which means that concerns exist about certain risk factors, such as population decline and loss of habitat. Classification as a species of concern does not provide additional regulatory protection. Coho salmon are relatively abundant in the Snohomish River basin. Because they use small, low gradient coastal and tributary streams for spawning and rearing, they need more off-channel habitat, such as oxbows, side-channels, and beaver ponds than Chinook. Adults are noted for their ability to ascend very small channels to spawn, sometimes only a foot wide and a few inches deep. Because they use small streams with limited space, they must use many such streams to successfully reproduce, which is why coho can be found in virtually every small coastal stream with a year-round flow.

More than 137 species of birds, mammals, amphibians and reptiles depend on salmon for one or more stages of their life, so they too will benefit from protection and restoration actions to recover salmon. For more detail, see the Snohomish River Basin Salmon Conservation Plan at: <http://www.sharedsalmonstrategy.org/plan/vol2.htm>.

A. Strategy: Continue to work with public and private agencies, conservation organizations and private landowners to develop wetland and implement projects, and find grant partners and funding to restore native salmon populations and their habitats, as outlined in the Salmon Recovery Act (see section 3.1.2) and the Snoqualmie Wildlife Area Fish Retrofit Report (see section 3.1.3). and natural processes where appropriate. *Funding:* W.A. operations budget. *Timeframe:* Ongoing.

B. Strategy: Work with Ducks Unlimited to complete proposal to restore 150 acres of diked and drained estuary on **Spencer Island Unit**. *Funding:* Approved Salmon Recovery Funding Board project. *Timeframe:* Complete in 2006-07.

2. Manage species and habitats in compliance with the Salmon Recovery Act of 1998

Section 10 of Engrossed Substitute House Bill 2496 (Salmon Recovery Act of 1998) directs the Washington State Conservation Commission, consulting with local government and treaty tribes, to invite private, federal, state, tribal, and local government personnel with appropriate expertise to form a Technical Advisory Group (TAG). The TAG's role is to identify limiting factors for salmonids. Limiting factors are any conditions that limit natural habitat from fully sustaining samlon populations. Analysis of the Snohomish River Watershed identified areas as limiting for Chinook salmon. The result of that effort is the Snohomish River Watershed (Water Resource Inventory Area - WRIA) 7 Salmon Habitat Limiting Factors Analysis (Haring 2000) that can be found at <http://salmon.scc.wa.gov/reports/wria07sum.pdf>.

This report states that one of the most profound impacts to salmonid habitat in the Snohomish River Watershed was the outright loss or reduction of functioning floodplains. Much of the historic salmon-production capacity may have been due to the vast presence of floodplain and estuarine wetlands, which are now reduced by 74 percent and 32 percent respectively (Haring 2000). Settlers drained and/or diked marshes and beaver ponds, and armored river banks, which decreased side channels and sloughs. River floodplain function has also been greatly impaired by ditching and straightening of channels, particularly in agricultural areas and along roads, to improve the drainage of naturally wet areas. Haas and Collins (2001) estimate a 40 to 60 percent loss of Chinook and coho production capacity due to this tremendous decrease in floodplain habitat.

The condition and complexity of most of the watershed's rivers and streams have been drastically altered by channelization, lack of large woody debris and associated pools, and loss of bank stability and complexity (Haring 2000). Large woody debris helps create habitat diversity, cover, pools, and collects and retains sediment and gravels. Much of the historical large woody debris was removed from the Snohomish and Snoqualmie rivers to improve navigation around the turn of the century. Dikes and levees, extensively managed agricultural areas, active removal of any wood that falls into the creeks, and active forest management have all further contributed to this lack of large woody debris.

Impaired riparian (streamside) functions throughout much of the Snohomish Watershed have resulted in increased river temperatures as well as a loss of bank stability, in-stream cover, and large woody debris recruitment. Riparian function has been severely impaired by removing streamside vegetation; building dikes/levees and roads in place of riparian

vegetation; formation of deep, narrow channels; and by altered river movements that affect the stability and integrity of stream banks (Haring 2000). Because of the importance of riparian function to salmonid habitat, it is critical to begin protecting and restoring riparian areas now.

A. Strategy: With Snohomish County Surface Water Management restore riparian vegetation and place large woody debris on **Crescent Lake Unit** adjacent to the Snoqualmie River.

Funding: Washington State Dept of Ecology grant. *Timeframe:* Begain in Spring 2006.

B. Strategy: With Ducks Unlimited and Washington Trout develop and implement a wetland enhancement project to restore portions of Cherry Creek drainage (**Cherry Valley Unit**). This will provide wetland benefits for fish and wildlife by improving habitat availability and access. *Funding:* WA State Duck Stamp funds. *Timeframe:* Design and development phase 2006.

C. Strategy: Work with the WDFW Technical Applications staff (TAPPS), Ducks Unlimited, and King County Surface Water Management to identify and implement projects on Stillwater Unit that will improve riparian corridor and wetland functions. *Funding:* WDFW TAPPS; SRFB, IAC or federal grant proposals. *Timeframe:* Ongoing.

3. Manage species and habitats in compliance with the Snoqualmie Wildlife Area Fish Retrofit Report

Dams, culverts, tidegates and other man-made features in waterways can become barriers to the seasonal movements of salmon and other fish that migrate between freshwater and the ocean to spawn. Management of The WDFW Hydraulic Code (Title 220 WAC), fish passage (RCW 77.57.030, RCW 77.57.040 and WAC 220-110-070), and screening (RCW 77.57.040, RCW 77.57.070 and RCW 77.57.010) regulations all require landowners to eliminate barriers to fish passage. Additionally, the recently passed tide gate law, or the 'intertidal salmon enhancement plan' (RCW 77.85.230) emphasizes habitat restoration on public lands.

A variety of fish passage barriers (culverts, dams, dikes/levees, and water quality) currently block salmon access to historic spawning and rearing habitats in many parts of the Snohomish Watershed. In addition, dikes and levees preclude or inhibit access to floodplain wetlands that could provide excellent rearing habitat. Wildlife Areas that include rivers, streams and estuaries must lead the way with salmon and other fish species recovery efforts, including an on-the-ground inventory of fish passage barriers.

In response to the Endangered Species Act listing of Puget Sound Chinook salmon in 1999, the Department conducted an inventory of all man-made structures on the Snoqualmie Wildlife Area in 1998 (Gower et al 1998). Each structure was evaluated for fish passage (culverts, dams, fishways) or fish safety (surface water diversions). Within the Snoqualmie Wildlife Area, all 18 barriers affect both anadromous and resident salmonids. These fish passage barriers will be corrected in priority order.

A. Strategy: Work with the WDFW Technical Applications (TAPPS) Program, Washington Trout and Ducks Unlimited to implement projects on **Cherry Valley Unit** that will remove fish passage barriers and entrapment areas to improve wetland

functions and restore associated channels. *Funding:* WDFW TAPPS and other grant sources *Timeframe:* *Ongoing*.

B. Strategy: Implement projects that will remove fish passage barriers and improve wetland functions on the Stillwater Unit with the help of WDFW Technical Applications staff (TAPPS). *Funding:* *WDFW TAPPS and other grant sources*. *Timeframe:* *Ongoing (Fish passage projects – Summer 2007)*.

C. Strategy: Implement projects on Crescent Lake Unit to remove fish passage barriers such as undersized and perched culverts and an earthen causeway and improve wetland functions with WDFW's Technical Applications staff (TAPPS). *Funding:* *WDFW TAPPS and other grant sources*. *Timeframe:* *Ongoing (Fish passage projects – Summer 2007)*.

D. Strategy: Implement projects that will remove fish passage barriers on the Corson Unit with the help of WDFW Technical Applications staff (TAPPS). *Funding:* *WDFW TAPPS and other grant sources* *Timeframe:* *Ongoing (Fish passage projects – Summer 2007)*

4. Manage weeds consistent with state and county rules

Weed control to protect public, economic and natural resources is required by state law (RCW Chapter 17.10). Invasive weeds are one of the greatest threats to fish and wildlife habitat quality. They compete with crops, may poison or injure humans and livestock, lower land values, create fire hazards, destroy native habitats, affect recreational opportunities and clog waterways. Cooperative weed control efforts are encouraged to improve efficiency and minimize impacts on adjacent landowners as part of the agency's good-neighbor policy. Snohomish and King counties have active weed control boards and the Snoqualmie Wildlife Area will work together with these weed boards and other state and local groups to improve weed and vegetation management on our lands. Efforts will be focused to produce a comprehensive weed management plan (see Appendix B).

A. Strategy: Work with the WDFW Weed Crew to monitor and control various known problem weeds on the **Stillwater** unit. This includes Japanese knotweed and purple loosestrife. *Funding:* Limited amount in W.A. operating budget. *Timeframe:* *Ongoing; as funding allows*.

B. Strategy: Identify noxious and invasive weeds, and inventory species and distribution on the Snoqualmie Wildlife Area units. *Funding:* *W.A. operating budget, WDFW Weed Crew* *Timeframe:* *Ongoing*.

C. Strategy: Determine the risk or threat level of each weed species to develop control priorities. Control efforts are prioritized by state and county listed weed species, critical fish or wildlife habitats or plant communities, riparian cover types, trails/access sites/roads, and neighboring boundaries. *Funding:* *W.A. operating budget, WDFW Weed Crew*. *Timeframe:* *Ongoing*

D. Strategy: Coordinate weed control efforts with federal, state and county agencies to maximize efforts. Apply for grants to control weeds, plant native vegetation, and utilize the WDFW Weed Crew. *Funding:* *W.A. operating budget*. *Timeframe:* *Ongoing*.

E. Strategy: Develop projects and apply for grant funds to control exotic/invasive weed species by restoring sites with native vegetation. *Funding:* *WDFW*. *Timeframe:* *Ongoing 2006-07*.

Agency Objective: Protect, Restore and Enhance Fish and Wildlife and Their Habitats

1. Protect, restore and enhance the structure and function of freshwater wetland and riparian habitats

The Snoqualmie Wildlife Area has a wide distribution and variety of wetland and riparian (streamside) habitats—rivers, streams, off-channel habitats and estuaries—which are critically valuable to many species including birds, mammals, reptiles, amphibians and fish, especially salmonids. Wetland and riparian habitats have remarkably high fish and wildlife densities and species diversity, and are important breeding habitat as well as important fish and wildlife seasonal ranges and movement corridors. Besides providing valuable habitat functions (food, shelter, hiding cover) for fish and wildlife, wetlands and riparian areas improve water quality by retaining sediment, contaminants, and floodwaters.

These habitats are not common and they are highly vulnerable to human alterations such as diking, draining, development, and erosion. Puget Sound lowland wetland habitats especially have declined dramatically since European settlement. The historic threats to wetland and riparian processes within the Snoqualmie Wildlife Area came from agriculture. For example, Spencer Island wetlands were diked, ditched and drained for cultivation and grazing. Large woody debris was continually removed from rivers so as not to hinder water transportation. More current threats include historic wetland modifications and an ever increasing local population and encroaching urban developments. These factors will further impact regional and local hydrology by changing the timing, delivery, quantity and quality of water within the Snoqualmie and Snohomish river systems.

A. Strategy: Work with public and private conservation organizations to develop wetland projects and grant funding to restore native habitats and natural processes where appropriate without harming neighboring properties or local hydrology.

Funding: WDFW W.A. operating budget *Timeframe:* Ongoing.

B. Strategy: Work within the guidelines of the WDFW Lands 20/20 planning processes to identify acquisition priorities and grant funds for wetland habitat protection, enhancement and restoration. *Funding:* WDFW W.A. operating budget. *Timeframe:* Ongoing.

C. Strategy: Follow local and state governmental guidelines regarding water quality and hydrology in rivers, wetlands and watersheds that apply to the Wildlife Area management procedures (State Hydraulics Act, etc). *Funding:* W.A. operating budget. *Timeframe:* Ongoing.

D. Strategy: Work with District Team and Citizen Advisory Group to evaluate proposed habitat restoration projects on all units. *Funding:* W.A. operating budget, Habitat Program. *Timeframe:* 2007-08.

2. Manage for species diversity

Washington is home to a remarkable variety of fish and wildlife species. However, changes to the landscape and native habitat as a result of human activity have put many of these diverse species at risk. In consultation with other governmental and nongovernmental organizations, the Department developed a Comprehensive Wildlife Conservation Strategy (CWCS) in 2005 with the intention of creating a new management framework to protect those species and habitats in greatest need of conservation. Its guiding principles include: 1) conserving species and habitats with the greatest need while recognizing the importance of keeping common species common, and 2) building and strengthening partnerships with other conservation agencies, tribes, local governments, and non government organizations.

State planning efforts through Washington's Comprehensive Wildlife Conservation Strategy are moving towards a more holistic approach of biological diversity. While Washington's CWCS only focuses on fish and wildlife species and their associated habitats, it is important to try to frame the discussion in the larger context of the state's full biological diversity. Most of the state's native animal species fall within the legal definition of "wildlife" and are under the purview of WDFW.

Biodiversity is the full range of life in all its forms and stages: the habitats in which various life stages occur, the complex interactions of species, habitats, and the physical environment, and the processes necessary for those interactions. The CWCS partially characterizes biodiversity as species richness of an area—the number of plants and animals that spend all or part of their lifecycle in a particular area. Washington is the permanent or temporary home to thousands of plant and animal species, including 140 mammals, 470 freshwater and saltwater fish species, and 341 bird species that use these habitats during some portion of their annual cycle ranging from breeding to migrations, as well as 150 other vertebrate species, more than 20,000 invertebrates, and 3,100 vascular plants.

By associating the Species of Greatest Conservation Need list with the 29 (of 32) basic habitat types found in Washington, and by further coordinating this list with the official Priority Habitats and Species habitat list (view at <http://wdfw.wa.gov/hab/phslist.htm>), it was determined that the following 20 habitats, broken into Priority One and Priority Two categories, will be considered the highest priorities for current statewide conservation action. The designated Priority One habitats have a greater number of associated Species of Greatest Conservation Need than the Priority Two habitats.

The Skagit Snoqualmie Wildlife Area has some diverse habitat types that are identified as priority levels one and two in the reference manual, *Wildlife-Habitat Relationships in Oregon and Washington*, used to classify habitats for the CWCS plan. Priority One habitats that apply are bays and estuaries, herbaceous wetlands, Westside lowland conifer-hardwood (mature) forest and Westside riparian-wetlands. Priority Two habitats are montane mixed conifer forest. Other Priorities are open water (lakes, rivers and streams) and agriculture, pasture, and mixed environs. The Snoqualmie Wildlife Area can be part of a proactive effort to protect and preserve fish and wildlife by focusing on Washington's biodiversity. However, to be effective it is necessary to identify what

species are present in order to develop appropriate management and restoration strategies. Other habitat and resource plans at the county and watershed level should be consulted to coordinate management/restoration plans and objectives.

A. Strategy: Identify and protect priority species and habitats as indicated in WDFW's Priority Habitat Species Plan and related recovery and management plans. *Funding:* WDFW. *Timeframe:* 2006-07.

B. Strategy: Develop a prioritized list of Snoqualmie Wildlife Area units in which to conduct an inventory of determine species, use and needs. *Funding:* W.A. operating budget. *Timeframe:* 2007-08.

C. Strategy: Inventory plants, plant communities, small mammals, birds, reptiles, amphibians, and invertebrates on the Snoqualmie Wildlife Area. *Funding:* Federal/state grant proposals, interns, volunteers, Advanced Hunter. Education members, conservation organizations (Audubon-birds, Native Plant Society-plants, etc.). *Timeframe:* After Comprehensive Wildlife Conservation Strategy is approved

D. Strategy: Assess the effects of unregulated harvesting of vegetation and invertebrates. *Advisory Group members have seen people harvesting vegetation and invertebrates on wildlife area.* *Funding:* WDFW. *Timeframe:* As funding becomes available.

3. Maintain, enhance and increase waterfowl populations and habitat

The Snoqualmie Wildlife Area was originally established to preserve the floodplain habitats and to provide agricultural crops enhancements for waterfowl population management and recreational hunting opportunities. Management priorities for the Wildlife Area have traditionally been focused on waterfowl, birds of prey, shorebirds and other avian species. Thousands of waterfowl use the Snoqualmie Wildlife Area annually, including dabbling and diving ducks, geese and swans, as well as shorebirds and other water birds.

The Snoqualmie Wildlife Area was historically surrounded by active farming operations. Local farmers would often plant cereal grain, corn and grass pastures on the Snoqualmie Wildlife Area via contract and sharecropping agreements. Over time, commercial farming has dramatically declined in the Snoqualmie Valley. Due to limited WDFW manpower and funding, the former grain and pasture fields have reverted to scrub and woody plants such as blackberry, willows and alders, or they are over grown with reed canarygrass and other exotic invasive plants. The abundance and diversity of wildlife species using these sites have declined, and as a result, the fish and wildlife oriented recreational opportunities have also been reduced.

Waterfowl habitat has steadily decreased throughout the Snoqualmie River Valley as population growth and development have increased unabated. Thus the need to retain, restore and enhance remaining natural habitats, such as the Snoqualmie Wildlife Area, has become a high priority.

A. Strategy: Develop habitat enhancement program to plant cereal grains such as corn, barley or winter wheat (up to 115 acres on **Crescent Lake Unit**, up to 150 acres on **Stillwater Unit**) to enhance wintering habitat for waterfowl. *Funding:* State Duck Stamp funds, IAC, other grants, conservation donations. *Timeframe:* As funding allows.

B. Strategy: Research and discuss opportunities to improve managed wetland functions on the **Cherry Valley, Crescent Lake** and **Stillwater** units for waterfowl. Funding: W.A. operating budget, Habitat Program. Timeframe: 2007-08.

Washington is home to a remarkable variety of fish and wildlife species. However, changes to the landscape and native habitat as a result of human activity have put many of these diverse species at risk. In consultation with other governmental and nongovernmental organizations, the Department developed a Comprehensive Wildlife Conservation Strategy (CWCS) in 2005 with the intention of creating a new management framework to protect those species and habitats in greatest need of conservation. Its guiding principles include: 1) conserving species and habitats with the greatest conservation need while recognizing the importance of keeping common species common, and 2) building and strengthening partnerships with other conservation agencies, tribes, local governments, and non government organizations.

Agency Objective: Minimize Adverse Interactions between Humans and Wildlife

Wildlife areas were purchased to preserve, protect and enhance fish and wildlife populations and their habitats, and provide fish- and wildlife-oriented recreational opportunities for the public. Recreational activities that are compatible with ‘preserving, protecting and enhancing fish and wildlife populations and their habitats’ are allowed and promoted on wildlife areas. Wildlife area biologists and managers realize that research indicates it is important to not disturb fish and wildlife during certain life cycle events. These may include breeding, nesting, migrating, winter-feeding, and roosting etc.

1. Monitor and manage public access to minimize negative effects on fish, wildlife and their habitats

As the population within Northwest Washington continues to grow, the potential for increased recreational use on the existing wildlife area land base will also grow. With this increased use comes, potential conflicts between user groups and potential impacts to wildlife habitat and their habitat. The long-term desire is to develop recreational use plans for heavily used areas and to better define the use restriction on sensitive or natural area units. These plans would be developed with input from WA staff, district team, and citizen advisory and stewardship group members.

A. Strategy: Work with District Team and Citizen Advisory Group to develop recreational use plans compatible with fish, wildlife and habitat objectives. This includes evaluating public uses, determining if use restrictions (length, destination and seasonal use of trails) are needed and if establishing stewardship groups would help meet these objectives. to designated trails outside of hunting seasons. *Funding:* W.A. operating budget. *Timeframe:* 2007-08.

B. Strategy: Maintain access area “Use Regulations” concerning firearms. This includes prohibiting the use of all firearms, except those acceptable during legal hunting seasons as stated in the hunting pamphlet. , posting larger signs that address NO Target Shooting, and using non toxic shot only. *Funding:* W.A. operating budget. *Timeframe:* 2006-07.

C. Strategy: Work with District Team and Citizen Advisory Group to evaluate the idea of limiting access to sensitive locations, such as Crescent Lake (night roost for swans) to the non-critical times for better protection of those priority species (**Crescent Lake Unit**). *Funding:* W.A. operating budget. *Timeframe:* 2006-07.

D. Strategy: Manage **Ebey Island Unit** as a Natural Area to preserve native species and plant communities. *Funding:* W.A. operating budget. *Timeframe:* Ongoing.

E. Strategy: Release rehabilitated wildlife on site only with permission of the Wildlife Area manager or district biologist. This caution better protects the existing fish and wildlife as well as the introduced animal or bird. *Funding:* W.A. operating budget. *Timeframe:* Ongoing.

Agency Objective: Provide Sustainable Fish and Wildlife-Related Recreational and Commercial Opportunities Compatible while Maintaining Healthy Fish and Wildlife Populations and Habitats

The WDFW has an obligation to provide sustainable fish and wildlife populations while offering compatible fish- and wildlife-oriented recreational opportunities. Current habitat enhancement programs for hunting include planting cereal grains, flooding fields seasonally, planting native vegetation, and manipulating water levels to boost the growth of native marsh/wetland plant communities, and native insect and amphibian populations (all natural food sources for water-fowl). Cereal grain enhancements—a long-standing tradition dating back to the 1950s—are especially popular with bird hunters. The Department's strategies and priorities for management will change as the status of species and habitats change, and as new information and science emerge. These changes may affect public use and other activities in the future.

Physical change is already set to happen in the near future on several Snoqualmie Wildlife Area's units (**Crescent Lake, Spencer Island, Stillwater**), and is a possibility in the near future for other units as well, depending on funding. Units with fish passage barriers are in the process of determining how best to remove or fix those to help recover threatened Chinook salmon runs without impacting current fish and wildlife populations and recreational uses.

The Department is therefore looking at the possibility of overlapping additional uses on its remaining hunting areas as a short-term solution, as well as securing replacement lands as a long-term solution. The Department is also looking for ways to increase public access on private lands and to work with other landowners for replacement hunting and viewing opportunities. Unfortunately, attempts to purchase available land nearby have not been successful due to lack of flexibility, timeliness, competition or seller reluctance. *The Citizen Advisory Group feels that as more estuary restoration projects occur on the Skagit Wildlife Area, (reducing that Wildlife Area's land-based recreational access hunting options,) more hunters will turn to the Snoqualmie Wildlife Area for their waterfowl and pheasant hunting. The Snoqualmie Wildlife Area is already crowded during these hunting seasons, especially on weekends. Therefore, additional land needs to be acquired and developed, especially for waterfowl and pheasant hunting.*

1. Provide and manage resource-compatible hunting and fishing opportunities

Many of the current wildlife area programs that provide habitat enhancements for fish and wildlife also improve recreational opportunities such as hunting and wildlife viewing. Efforts to provide such compatible opportunities are an important role of WDFW.

However the location of these activities may shift to a different land base as the strategies and priorities for management of WDFW lands are modified. These modifications in land management are the result of changes in the status of a species or habitats, and

applications of new information and science to management activities. These changes may affect public use and other activities on current sites in the future.

A. Strategy: Continue Western Washington Pheasant release program on **Cherry Valley, Crescent Lake** and **Stillwater** units. *Funding:* W.A. operations budget.

Timeframe: Every fall.

B. Strategy: Work with Citizen Advisory Group and District Team to maintain and improve fishing opportunities on appropriate units. *Funding:* W.A. operations budget. *Timeframe:* 2007-08.

C. Strategy: Develop a hunting guide for the Snoqualmie Wildlife Area. This would include up-to-date maps and information on parking, access and opportunities for all of the major hunting units. *Funding:* W.A. operations budget, grant proposals. *Timeframe:* As funding becomes available.

D. Strategy: Develop and provide educational materials for waterfowl hunters about hunting from boats in the intertidal and estuarine zone on **Spencer Island Unit**.

Funding: W.A. operations budget; apply for IAC grant. *Timeframe:* As funding becomes available.

E. Strategy: Provide cereal grain enhancements for waterfowl on the **Crescent Lake** and **Stillwater, Cherry Valley** units to increase waterfowl hunting opportunities.

Funding: Grants and State Ducks Stamp. *Timeframe:* As funding becomes available.

2. Pursue options to increase recreational opportunities

Competition for land is growing in Northwestern Washington; agriculture and farming organizations are very concerned about the available land base that is currently in agricultural production while other organization are concerned about the public land ownership and how that impacts county and local tax bases. Still other groups would like to increase residential and business development due to rising real estate prices. Because of these and other local concerns it is necessary to pursue and develop other mechanisms to provide wildlife oriented recreational access opportunities.

A. Strategy: Develop unique programs and innovative, competitive funding methods with WDFW staff, Citizen Advisory Group and others to successfully buy or lease land for much needed additional space for recreational opportunities. This may include fee simple ownership, long-term lease, acquiring public hunting easements on private property, etc. *Funding:* WDFW staff, interested stakeholders. *Timeframe:* Ongoing.

B. Strategy: Increase walk-in waterfowl and pheasant hunting and bird dog training opportunities with new acquisitions/easements. Land changed by Skagit Wildlife Area estuary restoration projects will shift more hunters to the Snoqualmie Wildlife Area. Even more areas are needed to reduce the existing crowded conditions here.

Funding: WDFW capital budget request, State Legislature, grant proposals.

Timeframe: As funding becomes available.

C. Strategy: Work with enforcement officers to educate hunters and enforce the 15-shell limit these sites to increase hunting opportunities. *Funding:* W.A. operations budget. *Timeframe:* 2006-07.

D. Strategy: Research options to provide recreational access to the nearby Honor Farm (coordinate with tribes, others) and **Ebey Island Unit** (coordinate with local

dike district and private landowners). *Funding:* W.A. operations budget. *Timeframe:* 2006-07.

E. Strategy: Begin discussions with Snohomish County Parks regarding potential to provide additional waterfowl hunting access to the County's portion of **Spencer Island Unit**. *Funding:* W. A. operations budget. *Timeframe:* 2007-08.

F. Strategy: Work with Citizen Advisory Group, District Team and others to develop and evaluate a pheasant release program at other upland sites and/or on private property, if owners are willing. *Funding:* W.A. operations budget. *Timeframe:* 2006-08.

3. Develop and maintain recreational access sites for public use

The WDFW provides fish- and wildlife-oriented recreational opportunities for all citizens, including juvenile, disable and senior citizens. The public needs access, which can include roads, parking lots, trails, toilets, reader boards, etc. Some access sites are vandalized, used as illegal dumping grounds or for parties, etc. This often causes seasonal closures of these areas.

One of the public's most common complaints is that our access areas are not properly maintained, including grading roads and picking up litter. *The people assigned to do this work have a large geographic area to cover, do not have an adequate budget or staff. Good, detailed maps, and highway and interpretive signage are all needed to properly inform and educate the public about rules and regulations as well as available outdoor recreational opportunities. Developing on-site vehicle use permit sales would be convenient for the public, potentially increase license revenues and may improve compliance of vehicle use permits.*

A. Strategy: Encourage and implement programs that reduce illegal dumping and vandalism at access sites. This may include Adopt-An-Access-Area, volunteer stewards, increased enforcement, dusk to dawn (gated) closures, etc. *Funding:* W.A. operations budget. *Timeframe:* 2006-07.

B. Strategy: Develop a prioritized access plan to improve ADA access (disabled and non) on the Snoqualmie Wildlife Area's units, with the Citizen Advisory Group and District Team. This plan could include parking, toilets, sanitation facilities, trails, hunting/ observation blinds and trails, and potential funding sources. *Funding:* W.A. operations budget. *Timeframe:* 2007-08.

C. Strategy: Work with Ducks Unlimited and Snohomish County Parks to complete Willie O'Neil Memorial (ADA) project on **Spencer Island Unit**. *Funding:* Partially funded through Capital Budget; IAC and other grant proposals. *Timeframe:* Begin in 2006.

D. Strategy: Work with other Department personnel to expedite the development of a detailed color map/informational brochure for the Snoqualmie Wildlife Area showing up-to-date boundaries, roads, parking areas, trails, boat launches, blinds, viewing areas, toilets, etc. *WDFW should have a document available for people to explain site by site the access and degree of ADA accessibility.* *Funding:* W.A. operations budget, grant proposals. *Timeframe:* 2007-08.

E. Strategy: Provide vehicle-use permit sales on-site or at nearby businesses. This would potentially increase revenues to the Department, which in turn would provide more funds for maintenance and development of access facilities. *Funding:* WDFW. *Timeframe:* 2006-07.

F. Strategy: Improve/update the Snoqualmie Wildlife Area website to provide accurate, detailed information about the site regulations, maps and directions to access areas, facilities available and ongoing projects. *Funding:* W.A. operations budget, other WDFW programs, volunteers. *Timeframe:* 2007-08.

4. Manage conflicting and/or overcrowded recreational uses

Urban development continues to move closer to the Snoqualmie Wildlife Area's Units. The increasing human population has also created high levels of recreational use on Western Washington's comparatively smaller Wildlife Areas. Combined with high demands and expectations from diverse user groups, the result is conflicts and overcrowding on some of the Snoqualmie's most popular units. Concentrated human use can also be detrimental to wildlife populations and/or habitat. Overcrowding is especially apparent during the pheasant and waterfowl hunting seasons.

People use the Snoqualmie Wildlife Area for a wide variety of reasons—some never imagined when these lands were purchased—not only to hunt, fish, watch wildlife, train hunting dogs, enjoy nature and photograph wildlife, but also to walk dogs, hike, jog, ride bikes, paddle kayaks and canoes, photograph wildlife, fly kites, orienteer, camp, play paintball, etc.

A. Strategy: Work with Citizen Advisory Group and District Team to evaluate current problems and possible methods to reduce crowded hunting and viewing conditions on various units. Some of these may include odd/even days; first come—first serve parking spaces and blinds; reservation system for blinds; limited numbers of hunters/viewers on specific per units; allowing only licensed hunters during hunting seasons on certain units; implementing a season of use for bird watching, dog training, etc. on units with conflicts; purchasing or leasing new walk-in bird hunting areas; and planting limited cereal grains on parts of Reserves for limited duck hunts. *Funding:* W.A. operating budget. *Timeframe:* 2006-08.

B. Strategy: Provide up-to-date educational materials on site about safe hunting and viewing and up-to-date current hunting seasons information on the reader boards. This information could also be provided to local user groups to post in their newsletters and placed on WDFW and other web pages. *Funding:* WDFW, grant proposals, local businesses partners (sell ad space). *Timeframe:* As funding allows.

5 Assess impact of dogs on wildlife area

Hunting with dogs and training bird dogs are traditional recreational uses on WDFW Wildlife Areas. According to the Migratory Waterfowl and Upland Game Seasons pamphlet, the bird dog training season is typically August 1 to March 31 each year. However, dog training may also be conducted year round on posted portions of wildlife area units, including the Snoqualmie. A valid small game license is required to train dogs on wild birds at any time. A small game license AND a Western Washington Pheasant Permit is required to train dogs on wild pheasants in western Washington. In addition, youth and seniors may also train dogs during their respective pheasant hunting seasons on designated western Washington pheasant release sites.

As Puget Sound's urban population grows, there continues to be an increasing demand for "off leash" dog walking areas in the Northwest. People have been using the

Snoqualmie Wildlife Area to walk their dogs for many years, and perhaps other dog owners are using the wildlife area to train their dogs for agility, earth dog training, lure coursing and other skills. With these unknowns, a unit-by-unit assessment needs to be made to determine what the various dog uses are and how or if these activities are adversely impacting fish, and wildlife or habitat resources and/or other fish and wildlife-oriented recreational users. *The Department can't let everybody do whatever they want on these sites.*

A. Strategy: Restrict bird dog training to selected units during the bird dog training season as described in the Migratory Waterfowl and Upland Game Season pamphlet, August 1st through March 31st. Currently **Cherry Valley** and **Stillwater** units are open. Review selected units annually with the Citizen Advisory Group and District Team in light of new information from subcommittee and other sources. *Funding:* W.A. operating budget. *Timeframe:* Annual, beginning in 2007.

B. Strategy: Form a well-rounded subcommittee (including Citizen Advisory Group members, dog trainers, hunters, fish and wildlife advocates, etc.) to examine this issue and offer recommendations to full Advisory Group, District Team and W.A. staff regarding what dog uses should be allowed where. Tasks would include understanding dog training/hunting uses and regulations on WDFW lands; understanding dog uses allowed/justifications on city, county, federal and tribal lands; developing a glossary of definitions; reviewing current literature regarding dog impacts on fish, wildlife and habitats; developing research project proposals and finding funding; and drafting short- and long-term strategy recommendations for each unit regarding dog uses on the Snoqualmie Wildlife Area. *Funding:* W.A. operating budget, volunteers, grant proposals. *Timeframe:* Begin in 2007.

C. Strategy: Allow year round dog training and field trials only on posted bird dog training areas/units (currently **Cherry Valley Unit**). These areas/units will be established with input from the District Team and the Citizen Advisory Group, and reviewed annually. *Funding:* W.A. operating budget. *Timeframe:* Ongoing with annual review.

6. Develop Watchable Wildlife recreational opportunities

The increased sales trend of vehicle-use permit indicates an increased interest in statewide wildlife viewing opportunities. Many Washington State residents are not aware that WDFW owns or controls thousands of acres that have been purchased, developed and managed as Wildlife Areas. The Department has not actively promoted or marketed these areas to the public since the early 1980's. However local and regional efforts to promote these sites will continue. A very comprehensive marketing program should be developed and implemented for Wildlife Areas. They are one of the tangible assets that the WDFW can guarantee and provide to the public as "A place to go to enjoy fish and wildlife oriented recreation." The Snoqualmie Wildlife Area has excellent potential to develop several watchable wildlife sites near large population centers in King and Snohomish counties. *Our Citizen Advisory Group was adamant that good, detailed maps, highway signs and interpretive signage are all needed in order to educate and inform the public about our Wildlife Areas. On-site or nearby vehicle-use permit sales should be provided for the public and would potentially increase revenues.*

A. Strategy: Develop Watchable Wildlife sites on the **Corson, Crescent Lake, Ebey Island** and **Spencer Island** units. *Funding:* Grants, city/county/tribal

partnerships, and local Audubon chapters. *Timeframe:* As funding becomes available.

B. Strategy: Provide web-based information specifically tailored to the Snoqualmie Wildlife Area. *Funding:* W.A. operating budget, college intern, volunteer, grant proposals. *Timeframe:* As funding or volunteers become available.

Agency Objective: Work with Tribal and Local Governments and Private Landowners to Ensure Fish and Wildlife Management Objectives are achieved

The Tulalip and other Native American tribes have at least part of their usual and accustomed hunting and fishing areas in the Snoqualmie Wildlife Area. As a sovereign government, they have an interest in creating and managing sustainable fish and wildlife populations and habitats.

Local government agencies and many private landowners also have a regulatory or personal interest in seeing that our fish and wildlife populations are well managed. WDFW will provide the Snoqualmie Wildlife Area Management Plan to tribes, local governments and the public for review and comment in the later half of 2006.

1. Develop and coordinate fish, wildlife and habitat conservation projects with interested stakeholders

Snoqualmie wildlife area is scattered throughout Snohomish and King counties. Because of the location of the wildlife area to large urban and growing suburban populations, there are a wide variety of interested stakeholders concerned about management action and the potential to impact fish and wildlife populations and the local community.

Developing communication with interest groups and stakeholders regarding management efforts will improve public understanding of the costs and benefits of fish and wildlife habitat management projects from an economic, species and habitat standpoint.

A. Strategy: Partner with tribal agencies to monitor the restoration projects on **Spencer Island** and other units as they are funded and implemented. *Funding:* Fish and Habitat Program. *Timeframe:* Ongoing.

B. Strategy: With tribes, the agricultural community, private landowners and county governments, continue to research and discuss additional projects and restoration efforts that will recover salmon populations. *Funding:* Fish and Habitat Programs, W.A. operating budget. *Timeframe:* Ongoing.

C. Strategy: Work with the local agricultural and tribal community concerning what is planted; retaining or planting hedgerows to create cover for wildlife; and how farming practices might benefit both farmers and fish and wildlife. *Funding:* Fish and Habitat Programs, W.A. operating budget. *Timeframe:* Ongoing.

D. Strategy: Submit Snoqualmie Wildlife Area Management Plan to tribes for review and comment. *Funding:* WDFW Capital budget. *Timeframe:* Ongoing.

E. Strategy: Develop a recreational use agreement with the Tulalip Tribe regarding the Honor Farm. *Funding:* WDFW Capital budget. *Timeframe:* As funding allows.

Agency Objective: Reconnect with those interested in Washington's fish and wildlife

Washington State's population has continued to increase and people of all ages are reconnecting with nature, pursuing fish and wildlife oriented outdoor recreational activities. In the past three years alone, there have been steady increases in the number of seniors buying WDFW licenses, which they can buy at a discount. It appears that as "baby-

boomers” move into retirement, many are choosing to pursue various outdoor activities. This is a segment of our population with a tremendous amount of knowledge, passion, time and energy. Wildlife Area managers realize that volunteer groups and individuals, when properly trained and supervised can provide invaluable assistance on special projects and on-going activities. *To improve efficiency and safety, the Department should hire a regional volunteer coordinator to supervise recruiting, training and staying connected with this volunteer force for maximum effectiveness.*

1. Continue to recruit and work with volunteers on committees, stewardship groups, work parties and individual projects

To reconnect with those interested in Washington State’s fish and wildlife and to improve local support, opportunities to connect with the public in the form of committee membership or volunteers for a variety of projects will be pursued. These efforts will provide the opportunity to improve communication with individuals and local interest groups, understand the recreation needs from the users point of view, and to improve fish and wildlife related recreation opportunities as well as fish and wildlife habitat.

A. Strategy: Continue holding regular meetings for and supporting the work of the Snoqualmie Citizen Advisory Committee. *Funding:* W.A. operating budget.

Timeframe: Ongoing.

B. Strategy: Continue hosting public workshops to inform and educate citizens and recruit volunteers for various levels of assistance. *Funding:* W.A. operating budget.

Timeframe: Ongoing.

C. Strategy: Identify and establish a stewardship group for each unit. Tap existing groups such as Pilchuck Audubon, Trumpeter Swan Society, Wash Waterfowl Assn., Ducks Unlimited, Pilchuck Wildlife Rehabilitators, local scout troops, etc.

Funding: W.A. operating budget. *Timeframe:* Ongoing.

D. Strategy: Develop a list of projects by unit that individual volunteers or groups could help complete. *Funding:* W.A. operating budget. *Timeframe:* 2006-07.

Agency Objective: Provide Sound Operational Management of WDFW Lands, Facilities and Access Sites.

Current The Office of Financial Management has facility conditions standards that require the ongoing maintenance of all wildlife area infrastructures. Often times these maintenance proposals are required by safety standards. The condition of the shop/storage building on the Cherry Valley Unit is very poor and needs to be replaced. It is more than 25 years old, part of its roof was lost during a snowstorm and it has been repeatedly vandalized because there is no official office on site and there is no presence nearby after hours.

Merging the Skagit and Snoqualmie Wildlife Areas into one complex (with the primary duty station currently in Skagit County) has created a WDFW presence vacuum here. *Under this current scenario, the Snoqualmie Wildlife Area Management Plan does not appear to be reasonable to implement, unless more resources are committed to the area to deal with the increasing volume of users and diversity of activities, and the geographic isolation from the Skagit headquarters.*

Another immediate need is for a local storage facility on or near the Snoqualmie Wildlife Area. A safe equipment storage facility is necessary for any work to be accomplished on site in a timely, efficient manner. Currently, traveling to the Snoqualmie from the Skagit

Wildlife Area can take 1-1.5 hours to reach units in Snohomish County, and 2-2.5 hours to reach units in King County. Traffic congestion and lengthy back-ups on the freeway and side roads in both counties are common every morning and afternoon. *The current situation of 'commuting' two to four hours each day to reach this wildlife area is highly inefficient.*

1. Maintain buildings, structures and public use facilities in compliance with all federal, state and local laws

A. Strategy: Inspect and maintain existing footbridges on **Cherry Valley, Corson, Crescent Lake and Stillwater** units. *Funding:* W.A. operating budget.

Timeframe: Annually.

B. Strategy: Build an equipment storage building on **Cherry Valley Unit** or rent one nearby.

Funding: WDFW Capital budget request. *Timeframe:* As funding allows.

C. Strategy: Mow fields on **Cherry Valley and Stillwater units.** *Funding:* W.A. operating budget. *Timeframe:* Annually.

D. Strategy: Mow and maintain meadow trails on **Crescent Lake and Stillwater Units.** *Funding:* W.A. operating budget. *Timeframe:* Annually.

E. Strategy: Maintain trails on **Corson Natural Area.** *Funding:* W.A. operating budget, volunteers. *Timeframe:* Annually.

F. Strategy: Inspect and maintain **Spencer Island Unit** dike trail once restoration is completed. *Funding:* Future operating budgets. *Timeframe:* 2008.

G. Strategy: Secure long-term funding source(s) for **Spencer Island Unit** ADA trail development and maintenance. *Funding:* WDFW Capitol budget/ IAC and other grant applications. *Timeframe:* Ongoing.

2. Evaluate fish, wildlife and habitat values of all units

The Snoqualmie Wildlife Area is a collection of six disjointed units, five of which are adjacent to the Snohomish or Snoqualmie rivers (Corson Unit is near Lake Cassidy). Human population increases and ceaseless development in King and Snohomish counties have dramatically impacted fish and wildlife habitats. These changes have the potential to degrade the habitat values of the Snoqualmie Wildlife Area for existing fish and wildlife populations.

These units need to be evaluated in terms of their current and future fish and wildlife habitat and recreational use values, their locations, and their ability to link with other adjacent or nearby lands to form larger, more complete natural landscapes. Wildlife Area staff, District Team, Citizen Advisory Group and other stakeholders should develop a process to analyze the best and highest use for each unit regarding fish and wildlife habitat potential and compatible fish and wildlife oriented recreational activities.

Units that do not have high priority fish and wildlife habitat or recreational use values for the WDFW or the public should be designated as surplus properties, and disposed of in an appropriate and timely manner. Without additional funding, it will be difficult to maintain the integrity of the Snoqualmie Wildlife units given surrounding land use and increasing human populations. An evaluation of these units is necessary to determine their long-term viability for fish and wildlife and whether WDFW has the resources to protect them.

A. Strategy: Work with Citizen Advisory Group, District Team, other stakeholders and adjacent/nearby landowners to analyze and evaluate current and potential fish, wildlife and habitat resource value of all units. *Funding:* W.A. operating budget. *Timeframe:* 2006-07.

B. Strategy: Identify/acquire lands as guided by the Lands 20/20 Plan to preserve wildlife habitat and to create linkages to other public and private conservation land ownerships. *Funding:* Regional Wildlife program. *Timeframe:* Ongoing.

C. Strategy: Partner with other multiple agencies on local planning efforts (private and federal) to develop an integrated management approach consistent with state and federal restoration and recovery efforts. *Funding:* WDFW Wildlife and Habitat and Fish programs 2006 operating budget. *Timeframe:* Ongoing.

3. Develop clear property boundaries

Property boundary questions exist on several Snoqualmie Wildlife Area units. Accurate ownership surveys are needed to improve the relationships with the neighboring landowners and before restoration projects can proceed.

A. Strategy: Develop and post the **Stillwater Unit** boundary. Its southern boundary is unclear and has come under question by the IAC. *Funding:* W.A. operating budget. *Timeframe:* 2006.

B. Strategy: Develop and post the **Cherry Valley Unit** boundary. This work will need to be done before any restoration/enhancement projects begin to ensure area of impact is within the Wildlife Area boundary. *Funding:* W.A. operating budget. *Timeframe:* 2006.

C. Strategy: Post boundaries for **Corson, Crescent Lake and Ebey Island** units. *Funding:* W.A. operating budget. *Timeframe:* 2007.

4. Provide fire management on agency lands

The wildlife area manager and habitat technician have received “blue card” fire training. This training allows wildlife area personnel to help coordinate fire fighting efforts. Air pollution from prescribed burns is a major concern in Western Washington. See Appendix C Fire Control Plan for details.

A. Strategy: Provide ‘blue card’ fire training for Wildlife Area staff and/or maintain certification. This training allows them to help coordinate fire fighting efforts. *Funding:* W.A. operating budget. *Timeframe:* Annual.

B. Strategy: Contract with local, state or federal entities to provide fire suppression support on the Snoqualmie Wildlife Area. *Funding:* W.A. operating budget. *Timeframe:* Annual

5. Develop, implement and refine a management plan for the wildlife area

The Snoqualmie Wildlife Area Management Plan will allow the WDFW, with internal and external review and input, to develop comprehensive criteria for acquiring and managing lands with annual reviews and updates.

A. Strategy: Develop and implement an adaptive management strategy that establishes testable hypothesis and a monitoring strategy to evaluate hypothesis. Use results from the program to Determine changes in land management practices necessary to comply with the conservation needs of listed species. *Funding:* W.A. operating budget. *Timeframe:* 2006-07.

B. Strategy: Provide the framework for all fish and wildlife recreational uses and provide funding for operations and maintenance of all the Snoqualmie Wildlife Area units. *Funding:* W.A. operating budget. *Timeframe:* Annual.

C. Strategy: Work closely with the Citizen Advisory Group, District Team and other stakeholders on unresolved issues. Existing unresolved issues include access/sanitation/ information needs and priorities; additional recreational land/opportunities; overcrowding /conflicting recreational uses; dog-related impacts; and Watchable Wildlife site needs. *Funding:* W.A. operating budget
Timeframe: Ongoing at Citizen Advisory Group's earliest convenience.

D. Strategy: Provide annual reviews and updates for Citizen Advisory Group, District Team and other stakeholders. *Funding:* W.A. operating budget.
Timeframe: Annual.

E. Strategy: Create and include supportive documents for this plan. This includes a Weed Management Plan, Fire Control Plan, Water Rights information and Flood Awareness and Evacuation Plan. *Funding:* W.A. operating budget. *Timeframe:* Done

6. Pursue additional funding opportunities

Wildlife Area budgets have failed to keep up with the increasing cost of doing business and the growing list of priorities and management objectives and obligations. For this reason funding to achieve long term management objectives such as enhancement and restoration projects must come from alternate funding sources outside of the general operations budget since many of the projects are very expensive and may take multiple budget cycles to complete.

A. Strategy: Apply for grants and other funding opportunities consistent with planned priorities to supplement existing funding. (e.g. Salmon Recovery Funding Board, North American Wetland Conservation Act, Interagency Committee for Outdoor Recreation, Duck Stamp, etc.) *Funding:* W.A. operating budget.
Timeframe: Ongoing.

B. Strategy: Establish sharecropping agreements with neighboring farmers to address agricultural cultivation needs and generate additional revenue to support enhancement project operation and management. *Funding:* W.A. operating budget.
Timeframe: Ongoing.

C. Strategy: Continue the volunteer program and develop internship program for students, citizen scientists, and other volunteers. *Funding:* W.A. operating budget.
Timeframe: Ongoing.

D. Strategy: Develop partnerships with other conservation government entities, e.g. federal, tribal, state, county, and local agencies. *Funding:* W.A. operating budget.
Timeframe: Ongoing.

E. Strategy: Seek out and develop partnerships with non-government fish and wildlife, conservation and agricultural organizations as well as national, regional and local sport and service groups (The Nature Conservancy, Washington Trout, Pilchuck Audubon, etc.). *Funding:* W.A. operating budget. *Timeframe:* Ongoing.

7. Protect cultural resources consistent with state and federal law

Federal and state law (National Historic Preservation Act - Sec.106) requires an assessment of cultural and historic resources on agency lands prior to implementing

activities that may impact those resources. Before the 1850s, it is estimated that Indian tribes or bands (groups of 100-300 people) lived and migrated along rivers. Since European settlement other valuable historic resources may exist on WDFW Wildlife Areas.

Prior to the 1900s, numerous Indian tribes or bands (100-300 people) lived along the Snoqualmie Wildlife Area river systems. In order to preserve these resources it will be necessary to perform cultural and historic resource assessments before implementing projects that may impact historic and cultural resources. Federal and state law (National Historic Preservation Act - Sec.106) requires an assessment of cultural and historic resources on agency lands prior to implementing activities that may impact those resources.

A. Strategy: Perform a cultural/historic resource assessment with assistance from the State Historic Preservation Department before implementing projects that may impact these resources. These projects may include estuary restoration, parking lots, toilets, buildings, new agricultural fields, posts for new fence line, etc. *Funding:* WDFW Contract process. *Timeframe:* As need arises and funding allows.

B. Strategy: Perform an initial assessment prior to acquisition. If proposed acquisition contains cultural/historic resources in need of preservation, request additional funding as a part of acquisition process. Where possible and feasible, adaptive use of historically and culturally important sites and structures will be considered. *Funding:* WDFW Olympia/Regional staff
Timeframe: As time and funding allow.

8. Perform administrative responsibilities

Administrative responsibilities and duties are important business functions necessary for efficient use of resources in order to accomplish identified goals and objectives according to plans. Record keeping and monitoring are necessary to ascertain activity status and what remains to be done, as well as providing a basis for adaptive management, e.g., making changes to a plan based upon undesired/unplanned outcomes from a management practice.

A. Strategy: Identify goals/objectives/tasks and write/update the management plan, strategies and annual performance measures based on them. *Funding:* W.A. operating budget. *Timeframe:* Ongoing.

B. Strategy: Develop and monitor budgets based on plans, supervise employees, maintain files and records, and monitor outcomes of tasks and projects in relation to agency objectives and agreed upon strategies. *Funding:* W.A. operating budget. *Timeframe:* Ongoing.

C. Strategy: Attend and participate in Snoqualmie and Snohomish Watershed Councils, Snohomish Salmon Recovery Forum and other meetings to stay current on salmon recovery and habitat restoration efforts. *Funding:* W.A. operating budget. *Timeframe:* Ongoing.

9. Maintain equipment

A. Strategy: Service all equipment including trucks, tractor and implements, weed sprayers, trailers, etc. Request replacement equipment when needed. *Funding:* W.A. operating budget. *Timeframe:* Ongoing as needed.

B. Strategy: Rent equipment when it is more efficient than acquisition. *Funding:* W.A. operating budget. *Timeframe:* Ongoing.

10. Pay county PILT and assessment obligations

11. Pay county assessment obligations

State law requires the agency to pay Payment in Lieu of Taxes (PILT) and county assessments. The Department of Fish and Wildlife is the only state agency to contribute directly to counties through “payments in lieu of taxes” PILT. For Department-owned areas in excess of 100 acres, county governments can elect to receive an amount equal to that currently paid on similar parcels of open space land, or choose the greater of \$.70 per acre or the per acre amount paid in 1984. Alternately, the county government may choose to receive fines or forfeitures on game violations that are prosecuted within the county. Revenues from fines vary depending on the number and seriousness of the infractions written in that area. Each county chooses whether PILT or game violation fines best meets its needs. In 2004, the Department paid \$429,000 to counties for payment in lieu of taxes.

A. Strategy: Pay counties ‘Payment in Lieu of Taxes’ fees and assessment obligations. *Funding:* W.A. operating budget. *Timeframe:* Annual.

CHAPTER 4. PERFORMANCE MEASURES, EVALUATION AND UPDATES TO THE SNOQUALMIE WILDLIFE AREA PLAN

Performance measures for the Snoqualmie Wildlife Area Plan are listed below. Accomplishments and progress toward desired outcomes will be evaluated to produce an annual performance report each calendar year. The plan will be considered a working document that will evolve as habitat and species conditions change, as new regulations are enacted, and as public issues and concerns change. Updates will be considered annually and added to the plan as needed.

1. Performance measures for the Snoqualmie Wildlife Area in 2006 include:

- Restore riparian vegetation and place large woody debris on **Crescent Lake Unit** adjacent to the Snoqualmie River with assistance from Snohomish County's Surface Water Management Division
- Identify potential riparian corridor and/or wetland projects on **Stillwater Unit** with WDFW Technical Applications staff (TAPPS), Ducks Unlimited, and King County's Surface Water Management Division
- Implement 1-2 projects on **Cherry Valley Unit** that will remove fish passage barriers and entrapment areas with WDFW Technical Applications (TAPPS) Program, Washington Trout and Ducks Unlimited.
- Develop and implement a wetland enhancement project to restore portions of Cherry Creek drainage (**Cherry Valley Unit**) with Ducks Unlimited and Washington Trout
- Complete proposal to restore 150 acres of diked and drained estuary on **Spencer Island Unit** Work with Ducks Unlimited
- Develop and post boundaries of the **Cherry Valley, Corson, Crescent Lake, Ebey Island and Stillwater** units
- Maintain access area "Use Regulations" concerning firearms on **Cherry Valley, Crescent Lake, Spencer Island and Stillwater** units
- Evaluate, with District Team and Citizen Advisory Group, limiting access to Crescent Lake (**Crescent Lake Unit**) to better protect those priority or sensitive species (swans)
- Work with enforcement officers to educate hunters and enforce the 15-shell limit these sites to increase hunting opportunities on **Cherry Valley, Corson, Crescent Lake, Spencer Island and Stillwater** units
- Research and discuss options to provide recreational access to the nearby Honor Farm (coordinate with tribes, others) and **Ebey Island Unit** (coordinate with local diking district and private landowners)
- Work with Licensing Division and local businesses to provide vehicle-use permit sales on-site or at nearby businesses
- Develop a list of projects by unit that individual volunteers or groups could help complete
- Analyze and evaluate current and potential fish, wildlife and habitat resource value of all units with Citizen Advisory Group, District Team, other stakeholders and adjacent/nearby landowners

Annual Performance Measures:

- Inspect and maintain 12 footbridges on **Cherry Valley, Corson, Crescent Lake and Stillwater** units
- Mow fields on **Cherry Valley and Stillwater** units
- Mow and maintain meadow trails on **Crescent Lake and Stillwater Units**

- Maintain trails on **Corson Natural Area**
- Release 3,100 to 3,800 pheasants on **Cherry Valley, Crescent Lake** and **Stillwater** units
- Allow bird dog training on **Cherry Valley** and **Stillwater** units
- Review units open to bird dog training with the Citizen Advisory Group and District Team
- Allow year round dog training and field trials on **Cherry Valley Unit**
- Review areas to keep open for year round dog training and field trials with District Team and Citizen Advisory Group
- Provide 'blue card' fire training for three Wildlife Area staff and maintain certification of area manager and habitat technician
- Contract with local, state or federal entities to provide fire suppression support
- Attend and participate in monthly to quarterly meetings of the Snoqualmie and Snohomish Watershed Councils, Snohomish Salmon Recovery Forum and other entities
- Service all equipment including trucks, tractor and implements, weed sprayers, trailers, etc.
- Pay counties 'Payment in Lieu of Taxes' fees and assessment obligations.

Ongoing Performance Measures:

- Identify noxious and invasive weeds, and inventory species and distribution
- Determine the risk or threat level of each weed species to develop control priorities
- Coordinate weed control efforts with other agencies
- Apply for grants to control weeds, plant native vegetation, and utilize the WDFW Weed Crew
- Work closely with the Citizen Advisory Group, District Team and other stakeholders on unresolved issues (access/sanitation/information needs and priorities; additional recreational land/opportunities; overcrowding /conflicting recreational uses; dog-related impacts and Watchable Wildlife site needs).
- Apply for grants and other funding opportunities consistent with planned priorities to supplement existing funding. (e.g. Salmon Recovery Funding Board, North American Wetland Conservation Act, Interagency Committee for Outdoor Recreation, Duck Stamp, etc.)
- Establish 1-2 sharecropping agreements with neighboring farmers to address agricultural cultivation needs and generate additional revenue to support enhancement project operation and management.
- Develop internship program for students, citizen scientists, and other volunteers
- Partner with tribal agencies to monitor the restoration projects on **Spencer Island** and other units as they are funded and implemented
- Research and discuss additional habitat projects and salmon restoration efforts with tribes, the agricultural community, private landowners and county governments
- Work with the local agricultural and tribal community concerning what is planted on units and nearby fields; retaining or planting hedgerows for huntable and watchable wildlife; and how farming practices might benefit both farmers and fish and wildlife
- Work with public and private conservation organizations to develop wetland projects and grant funding to restore native habitats and natural processes where appropriate without harming neighboring properties or local hydrology
- Develop unique programs and innovative, competitive funding methods with WDFW staff, Citizen Advisory Group and others to successfully buy or lease land for much needed additional space for recreational opportunities

- Continue holding regular meetings for and supporting the work of the Snoqualmie Citizen Advisory Committee
- Provide updates and reviews for Citizen Advisory Group, District Team and other interested stakeholders
- Continue hosting public workshops to inform and educate citizens and recruit volunteers for various levels of assistance
- Identify and establish a stewardship group for each unit

Performance Measures 2007-2008:

- Implement 1-4 projects that will remove fish passage barriers and improve wetland functions on the **Stillwater Unit**
- Implement 1-3 projects on the **Crescent Lake Unit** to remove fish passage barriers
- Implement 1-3 projects to remove fish passage barriers on the **Corson Unit**
- Research opportunities to improve managed wetland functions on the **Cherry Valley, Crescent Lake and Stillwater** units for waterfowl and discuss with Citizen Advisory Group and District Team
- Evaluate proposed habitat restoration projects on all units with District Team and Citizen Advisory Group
- Develop a prioritized list by unit in which to conduct an inventory of determine species, use and needs
- Work with Citizen Advisory Group and District Team to maintain and improve fishing opportunities on appropriate units
- Begin discussions with Snohomish County Parks regarding potential to provide additional waterfowl hunting on County's portion of **Spencer Island Unit**
- Develop and evaluate a pheasant release program at other upland sites and/or on private property (if owners are willing) with Citizen Advisory Group, District Team and others to
- Work with other Department personnel to expedite the development of a detailed color map/informational brochure for the Snoqualmie Wildlife Area
- Work with WDFW staff to improve/update the Snoqualmie Wildlife Area website to provide accurate, detailed information about the site regulations, maps and directions to access areas, facilities available and ongoing projects

When Funding/Assistance is Available:

- Plant up to 115 acres with cereal grains on **Crescent Lake Unit**
- Plant up to 150 acres with cereal grains on **Stillwater Unit**
- Work with the WDFW Weed Crew to monitor and control various known problem weeds on the **Stillwater Unit**
- Develop projects and apply for grant funds to control exotic/invasive weed species by restoring sites with native vegetation.
- Assess the effects of all existing uses, including such actions as the unregulated harvesting of vegetation and invertebrates, as well as the effects of proposed management programs and projects on species composition and diversity
- Create inventory surveys and facilitate on-the-ground surveying of performing and facilitating the development of inventory surveys for plant, plant community, small mammals, birds, reptiles, amphibians, and invertebrates per prioritized list of units
- Develop a hunting guide for the Snoqualmie Wildlife Area

- Develop and provide educational materials for waterfowl hunters about hunting from boats in the intertidal and estuarine zone on **Spencer Island Unit**
- Work with Ducks Unlimited and Snohomish County Parks to complete Willie O'Neil Memorial (ADA) project on **Spencer Island Unit**
- Provide up-to-date educational materials on site about safe hunting and, viewing and up-to-date current hunting seasons information on all reader boards
- Develop Watchable Wildlife sites on the **Corson, Crescent Lake, Ebey Island** and **Spencer Island** units
- Provide web-based information specifically tailored to the Snoqualmie Wildlife Area
- Build an equipment storage building on **Cherry Valley Unit** or rent one nearby
- Inspect and maintain **Spencer Island Unit** dike trail once restoration is completed
- Secure long-term funding source(s) for **Spencer Island Unit** ADA trail development and maintenance
- Perform a cultural/historic resource assessment, prior to acquisition, with assistance from the State Historic Preservation Department

APPENDIX 1. PUBLIC ISSUES

Snoqualmie Wildlife Area District Team, Citizens Advisory Group and Public Issues and Concerns

The following comments are from meetings with the Snoqualmie Wildlife Area's District Team and Citizen Advisory Group that took place over 2005 and 2006. These comments are not in any order. Underlined comments are from the Department's District Team.

Issue A. Access/Recreation

- Put trails on current/proposed dikes (influences people to 'attach' to a place, become better stewards)
- Make units more accessible for walk-in hunters, birders, anglers, volunteers (trails, finger piers, footbridges, jetties, ponds)
- Survey/maintain/improve bridges across ditches
- Keep dikes mowed and maintained
- Must replace loss of public access if restoration projects proceed
- Don't begin restoration projects until AFTER replacement hunting land has been bought
- Consider building a birding (observation) tower
- Improve access for disabled persons
- Make it easier to buy parking permits near units/parking areas
- Wetland restoration is great if it will benefit ducks and duck hunting
- Explore role pheasant plots might play in wildlife viewing opportunities
- Moist Soil cells/ponds need to provide safe spacing and distance between decoy hunters
- Need measures to limit # of hunters to retain quality and safe hunting (odd/even days, 15 shell limit, etc.)
- Concerned about lost bird watching opportunities if restoration occurs
- Maintain/improve parking areas and boat ramps
- Need to strike a balance by accommodating hunters who don't have boats
- Provide trash receptacles and keep litter picked up
- Provide and maintain clean toilets, and add restrooms that accommodate the disabled
- Loss of pedestrian access on restored sites
- Continue to manage as a quality waterfowl hunting area
- Dike top trails not appropriate
- User conflicts (premier birding area plus waterfowl hunting)
- Parking areas are small and undeveloped
- Need ADA accessible seasonal toilets
- Improve/renovate access at Lukas Slough as a watchable wildlife site
- Need to prohibit vehicle access but allow pedestrian access

Issue B. Wildlife Area Management

- Break units into manageable chunks to better discuss/plan recovery efforts
- Considering WDFW's exposure to tidegate litigation, some land is attractive for restoration
- Coordinate restoration with local agricultural community, residents and local diking and drainage districts
- Contact County Health Dept. about possible soil contamination via restoring estuary

- Forget salmon restoration, land was purchased for waterfowl, keep it that way
- Needs to be a balance between resource and users for a win-win situation
- Make planted fields for waterfowl food and hunting areas a priority
- How much will wintering snow geese suffer if feeding habitat is lost to salmon restoration
- Other uses are as important to public as salmon restoration
- Need long term permit to keep boat ramp dredged
- Keep dikes intact and develop dike maintenance plans
- Buy out remaining private land
- Engage local colleges and high schools to assist with aspects of management
- Conflict regarding how agency manages (man-maintained moist soil cells/natural estuary processes)
- Moist soil management might impact fish passage, stranding, in stream habitat and riparian management around impoundment
- Cells could be a mosquito problem if there is any standing water
- Might be some potential for restoration at Cottonwood along dike/slough to river
- Need to maintain moorage facility to manage units
- Possible conflicts between land assignments in Department's and other agency's processes
- Need consistent standards for public use/fish and wildlife management between agency and other lands
- Does our strategy dovetail with local county's strategy
- How to balance public access/uses with wildlife and fish management goals
- Public wants longer, loop walking trails but shorter point access viewing areas are less harmful for fish and wildlife
- How to reduce conflicts between user groups
- Dog training and running not compatible with breeding in spring-early summer
- Need to cooperate with DOT, pipeline co., private landowners to implement restoration projects
- Need to survey ownerships and identify in-holdings for purchase
- Need to pursue funding opportunities to systematically replace lost hunting and species-specific areas
- Need to develop long-term strategy for acquisition recommendations
- Who will maintain agency fish ways and inspect private fish ways

Issue C. Habitat

- Multi-species approach to restoration projects is important
- Many miles of fish corridors could be created throughout the whole estuary
- Entire site should be restored to estuarine marsh
- What will the impacts to local hydrology be?
- Explore restoring side channels for salmon without disrupting waterfowl/swan use
- Consider estuary restoration in conjunction with or as alternative to moist soil management
- Explore dike setback options with local Drainage District to improve hydraulic connections
- Identify and control invasive plants – start with 'hot spots'
- Plant sweet gale in estuary for further restoration
- Re-establish native plant communities
- Need to enhance the hundreds of acres outside the dikes

- Bring all of the land into food production for waterfowl
- Make sure winter wheat is sufficient for the birds when they arrive in fall
- Lack of connectivity (travel corridors) for fish and wildlife between/within units
- Potential effect of sea level rise
- Tidegate is fish passage barrier
- Pump station is potential risk to fish
- Invasive plant species need to be controlled
- Estuary restoration would reduce amount of winter wheat for snow geese
- Explore option to remove riprap along bank and establish riparian buffer

Issue D. Roads/Waterways

- Maintain or improve road surfaces

Issue E. Enforcement

- Enforce the use of the stewardship decal
- Users who park off-site (don't buy stewardship decal and park on road) disturb local landowners

Issue F. Public Information, Education, Involvement

- Need to provide early and continuous opportunities for public to participate in proposed estuary restoration (Wylie Slough proposal is example of how NOT to involve public)
- Need warning signs about rapidly changing tides for foot hunters (after restoration work)
- Use trails to bond people to the site for stewardship purposes
- Post 'Rules of Conduct' for all users
- Increase messages to explain/promote how crowd reduction strategies promote quality hunting
- Provide interpretive signage about area's purpose, species life history, user's role
- Limit number of regulatory and warning signs
- Install 'watchable wildlife area ahead' signs on roads
- Refresh signs in kiosks
- Need professional, updated maps of units showing roads, water, access sites, parking, trails, etc.
- Need interpretive materials

Issue G. Monitoring, surveying, inventory

- Need to monitor and document public use of wildlife area units
- Develop stewardship groups (volunteers) to supplement W.A. staff and get things done
- Will there be effectiveness monitoring of restoration projects
- Maintain and increase the use of local stewardship groups

Issue H. Other

- This process is on too fast a tract for public and agency staff to adequately and professionally respond to create a useful, realistic quality product
- Agency does not seem committed to maintaining access sites (enough funding to regularly clean toilets, pick up garbage)

- Need to increase W.A. staff to implement these strategies
- Need to increase staff to deal with increasing legal requirements, illegal dumping, meth labs and other inappropriate uses

Additional Public Comments

Snoqualmie Wildlife Area CAG Comments by Objective

Agency Objective: Protect, Restore and Enhance Fish and Wildlife and Their Habitats Maintain, enhance and increase fish and wildlife populations and habitat

- There needs to be a strategy for management invertebrates, especially for Crescent Lake Unit

Manage for species diversity

- There is always a need, funding is key to implementation of surveys, look into groups such as UW
- Describe the term “baseline” it is misleading, “existing conditions” may be a better term
- Other species groups such as amphibians and reptiles need to be considered in the species diversity categories.

Agency Objective: Ensure WDFW activities, programs, facilities and lands are consistent with local, state and federal regulations that protect and recover fish, wildlife and their habitats

Manage species and habitats in compliance with the Endangered Species Act and Washington State, fish passage rules, etc.

- Who determines what a priority species is, is this a WDFW definition?
- WDFW determines species of concern and associated habitats

Agency Objective: Minimize adverse interactions between humans and wildlife

Monitor and manage public access to minimize negative effects to fish and wildlife

Strategy: Maintain access area “Use Regulations” that prohibit the use of rifles and handguns, except during legal hunting seasons or when utilized with legitimate dog training or authorized field trials.

- Current use regulations prohibit use of rifles and handguns. At least that is what is posted at parking lots.
- Is it legal to use shotgun for training?

Strategy: Limiting access to “Watchable Wildlife” sites to the non-critical times for those species

- Consider including as strategy the language from Skagit Plan that allows for potential to restrict areas to hunters only during season

Agency Objective: Provide Sustainable Fish and Wildlife-Related Recreational and Commercial Opportunities Compatible With Maintaining Healthy Fish and Wildlife Populations and Habitats.

Provide public access compatible with fish, wildlife, and habitat protection

- Concerned how the reduction of pheasant hunting acreage at Headquarters and Leque will impact Snoqualmie Units?
- Will management change on the Snoqualmie Units?
- Overcrowding problems on Snoqualmie are likely to increase
- Over crowding and loss of hunting access are major concerns for pheasant hunters both in Skagit and Snohomish counties, perhaps tribal land ownerships such as the Honor Farm and Fornsby Creek are potential public hunting option

- Tribal time and money will not be spent for introduced species on reservation property, management on reservation is primarily for native species
- Where does issue of adverse interactions between humans and wildlife come in to play in terms of Crescent Lake and increased use of area as night roost for swans; corn on Honor Farm has increased swan use by the hundreds on agriculture fields adjacent to Crescent Lake.
- Negotiate lease for property, continue to monitor potential conflicts
- Are the Honor Farm lands considered tribal? If so, does this decrease enforcement of lead shot rules on wildlife areas.

Strategy: Complete the proposed 150-acre Spencer Island estuary restoration and the Willy O'Neil Memorial ADA access and hunting blind projects in partnership with Ducks Unlimited and Snohomish County on the WDFW portion of Spencer Island Unit.

- What is the plan for the \$100,000 appropriated by the legislature?
- Money was originally going to go for park bench, but family and friends insisted on access project
- *Strategy: Continue pheasant release program on the Cherry Valley, Crescent Lake, and Stillwater Units to provide upland game bird hunting opportunities.*
- Concerned about loss of area south of Harris Creek to blackberry and alders, reduction of pheasant hunting acreage, need to find way to manage vegetation
- Perhaps non-agency personnel would be better suited to approach landowner for access
- ****Look into access over O'Hanley property****

Strategy: Identify potential sites to acquire or lease property that will provide additional sites for wildlife orientated recreational opportunities.

- Continue to research access to honor farm
- Let's add a strategy for public access (legal) to Ebey Island Unit.
- In WA, if you are landlocked you can get legal access
- Research access issues
- It would be great if Dike District would allow access, but would bring host of other properties
- Field trip in months ahead

Manage increasingly conflicting recreational uses

- Prohibit non-wildlife oriented activities such as paintball, lure coursing
- Paintball gun classified as firearm (shoots projectile)_
- Include on Use Regulations sign (paintball)
- Users should need non-charge permit for dog training

Develop additional Watchable Wildlife recreational opportunities

- Use of these areas may be more influenced by King Co. and their website

Agency Objective: Provide Sound Operational Management of WDFW Lands, Facilities and Access Sites.

- This plan does not appear to be able to be implemented unless there is a commitment to put a manager or asst. manager on site in order to deal with the volume of people, diversity of activities, and geographic isolation (traffic) from Skagit H.Q.
- If we don't plan for manager in this location we'll be shooting our selves in foot; plan for expansion
- Increasing population of King/Snohomish Counties

Snoqualmie Wildlife Area – Comments by Unit

Cherry Valley Unit

Habitat: 386 acres of managed agricultural fields - now in reed canary grass (invasive weed), with drainage ditches and 15 small man-made ponds, 50 acres of forested wetland and 50 acres of forested hillside, flooding is common

Uses: Provides habitat for dabbling ducks, ruffed grouse and songbirds, waterfowl hunting, pheasant hunting, dog training and trials, fishing, wildlife observation, hiking, two parking areas

Proposals: Restore Cherry Creek and wetlands (cooperative project with Washington Trout and Ducks Unlimited)

Public Issues: Enforce the non-toxic shot rules for all uses, especially dog training
Educate shooters via signs regarding the use of non-toxic shot
Ensure that this unit remains open to the many dog-related activities that take place here (field trials, hunt tests, obedience, tracking, agility, rescue, dog walking, hunting with dogs)
Remove the reed canary grass and replant with grains
Add 2-3 more handicapped accessible blinds and access to them
Improve parking off Highway 203 for wheelchair hunters to get to gravel path
Make sure there are enough crossing points in restored area for folks who park off of Hwy 203 to get to the back of the property for pheasant hunting
Need finger piers in a number of areas and possibly ponds made in those areas

DT Issues: 22 fish passage barrier features in this unit (mainly coho, few steelhd, Chinook)
Need someone to consistently check DU proposed fishway (from WDFW)
Can moist soil management for waterfowl also benefit fish
Fish stranding during drawdown period
Conflicting public uses – what should the balance be
Can restore fish habitat/wetlands without impacting adjacent neighbors?
Good site for experimentation (intense management vs. natural processes)
Providing public hunting and watchable wildlife opportunities
Consult with local drainage district if change hydrology
Increasingly urbanizing area means increasing level of conflicts
Need to analyze units/areas at the landscape habitat level

Strategies: Analyze unit at the landscape habitat level
Research feasible options for restoring/enhancing both fish and wildlife habitat
Determine priority value: habitat, fish, wildlife, hunting, passive recreation
Educate and enforce the non-toxic shot rules for all uses, especially dog training
Educate users regarding funding situation for WDFW lands
Research potential pheasant release sites on private land
Determine ‘seasons of use’ for diverse users

Corson Natural Area

Habitat: 160 acres of typical western Washington bottomland, two man-made ponds; donated, deed requires vegetative manipulation to enhance wildlife habitat and public enjoyment

Uses: Provides habitat for dabbling ducks and ruffed grouse, limited undeveloped access (via private property) for hiking and wildlife observation, hunting not allowed

Proposals: None at this time

Public Issues: Improve disabled access for persons in wheel chairs

DT Issues: Manager no longer there
Continue to actively manage this site?
Lots of educational uses
If Lynn Dye leaves, access and parking might change
Explore access/parking with adjacent landowner(s)
How to maintain nature trails – what level of service
Pond with control structure might be fish barrier
Adjacent to other public land

Strategies: Develop a site-specific management plan
Research deed restrictions
Honor Corson's/Dye's vision

Crescent Lake Unit

Habitat: 360 acres - 240 in forest and shrubs, 120 in managed agricultural land, sharecropped to provide cereal grains for wildlife

Uses: Provides dabbling duck and ruffed grouse habitat, pheasant hunting, waterfowl hunting, fishing, wildlife observation, hiking, two parking areas

Proposals: None at this time

Public Issues: Need enforcement presence and more signs to stop illegal trap shooting and use of lead shot going into lake (first hand account-MJ)

Trails would be good

Need map of this unit posted so we know where to go to stay on WDFW property

Continue use of this area for dog-related activities

Clean up the existing waterways at this site

Work with Tribe to get access to Honor Farm property across the street (large fields would be ideal wetland site or to plant grain crops)

Glad you're leaving this site as is

DT Issues: 2 culverts need replacement or removal

Riparian restoration along Snoqualmie River

Exotic plant and fish species removal (knotweed) (warmwater fish)

Tulalip Tribe buying land at Honor Farm (in process)

Snoqualmie Tribe interested in habitat restoration in this area

Can moist soil management for waterfowl also benefit fish

Fish stranding during drawdown period

Conflicting public uses – what should the balance be

Can restoration/wetland projects happen without impacting neighbors

Good site for experimentation (intense management vs. natural processes)

Providing Public hunting and watchable wildlife opportunities

Increasingly urbanizing area

Need to analyze units/areas at the landscape habitat level

Continue to grow grains/sharecrop unit?

Improve and maintain for waterfowl?

Continue to mow wide walking trail in woods (used heavily by birders)?

Strategies: Analyze unit at the landscape habitat level

Research feasible options for restoring/enhancing both fish and wildlife habitat

Determine priority value: habitat, fish, wildlife, hunting, passive recreation

Educate and enforce the non-toxic shot rules for all uses, especially dog training

Prioritize and divide values/uses/users amongst units

Educate users regarding funding situation for WDFW lands

Explore options to control exotic plant and fish species

Research potential pheasant release sites on private land

Ebey Island Unit

Habitat: 420 acres of forested wetland

Uses: Protects one of few natural forested (Sitka spruce) wetlands left in Snohomish County, provides waterfowl and nongame habitat, no public access

Proposals: None at this time

Public Issues: Leave as is

Provide access for people doing surveys, bird counts, etc.

Be sure illegal target shooting is not occurring on this site

GET SOME LEGAL ACCESS FOR HUNTERS!!!!!!! (people are already hunting this site, trespassing to get there)

This site is prime for walk-in hunters and you are looking for replacement areas

Improve disabled access for persons in wheel chairs

DT Issues: Access is very limited, additional access would require funding

Conserve as a natural area

Invasive plant species (knotweed, Him. Bb, scotch broom) need to be controlled

Strategies: Continue to manage as a natural area

Control invasive plant species (knotweed, Him. Bb, scotch broom)

Spencer Island Unit

Habitat: 174 acres of Snohomish River delta that was diked and grazed, 50 acres of tidally influenced estuary created for salmon species, 150 acres were breached due to failed dike in winter 2004

Uses: Provides habitat for bald eagles, waterfowl, shorebirds and songbirds, provides waterfowl hunting, nature observation, hiking, dike trail part way around perimeter of island

Proposals: Restore 150 acres of estuary for salmon recovery, waterfowl and other fish and wildlife species in partnership with Ducks Unlimited, provide public access with trails on island's west side and trails to blinds, and access for persons with disabilities (Willie O'Neil Memorial) (*funding available*)

Public Issues: Support restoration plan as described above
Would like to see WDFW acquire more property in Snohomish River/estuary area
Need Integrated Vector and/or Pest Management plans for this site
Make this area more accessible for walk-in hunters
Put finger dikes/jetties around dikes so hunters can get out into water to hunt
Need warning signs - hunters could experience tidal changes (could be deadly)
Boaters were coming into area through breach last year (and into Sno. Co. reserve as well) so need delineations on the water
Improve disabled access for persons in wheel chairs
Need blinds for disabled and access to those blinds
Include trails for bird watchers (include footbridges over dike breaches)

DT Issues: Manage conflicting uses between hunters and passive users and dog owners
Exotic plant species control (purple loosestrife, RCGrass)
Provide public hunting and watchable wildlife opportunities
Increasingly urbanizing area
Need to analyze units/areas at the landscape habitat level

Strategies: Evaluate long-range trail maintenance costs
Evaluate further intertidal restoration opportunities
Support DU restoration proposal and Willie O'Neil ADA accessibility proposal
Increased public use management (first come first serve?-for ADA)
Determine 'seasons of use' for diverse users

Stillwater Unit

Habitat: 456 acres at confluence of Harris Creek and Snoqualmie River, border river; agricultural fields, brushy draws, two small lakes (5 acres), winter flooding common, no longer farmed by sharecroppers, King County trail along east edge of property

Uses: Provides dabbling duck and songbird habitat, waterfowl hunting, pheasant hunting, fishing, dog training, wildlife observation, two parking areas

Proposals: Restore wetlands throughout entire site (*conceptual*) proposed by Cascade Land Conservancy, Ducks Unlimited, WDFW and King County

Public Issues: Restoration needs to address broadest use possibilities – salmon, waterfowl and swans (you can have a lot when you start thinking outside the box and get creative)
Ensure that this unit allows the many dog-related activities that take place here (field trials, hunt tests, obedience, tracking, agility, rescue, dog walking, hunting with dogs)
Enhance and increase the dog-related activities here
Restoring wetland a good idea as long as enough land is left for pheasant hunting
SW portion only accessible by foot, reverting back to alder and woods
SW corner not very accessible (adjoining landowner denies hunters access) so this is where wetland restoration should take place
Bridge Harris Creek so equipment can open it up (+ allow more wildlife viewing)
Improve disabled access for persons in wheel chairs
Need blinds for disabled and access to those blinds
Purchase, lease and/or develop additional comparable areas to replace lost pheasant hunting
Area by south parking lot is great for birding
Restoration plan looks good

DT Issues: 6 fish passage barrier features
Dog feces management/control
Riparian restoration needs to happen along section of Snoqualmie River
Can moist soil management for waterfowl also benefit fish
Fish stranding during drawdown period
Conflicting public uses – what should the balance be
Can implement restoration/wetland projects without impacting neighbors?
Good site for experimentation (intense management vs. natural processes)
Providing Public hunting and watchable wildlife opportunities
Increasingly urbanizing area
Need to analyze units/areas at the landscape habitat level
Eroded area along Snoq. River could be signed as dangerous area
Use of reclaimed water for wetland enhancement

Strategies: Analyze unit at the landscape habitat level
Research feasible options for restoring/enhancing both fish and wildlife habitat

Determine priority value: habitat, fish, wildlife, hunting, passive recreation
Educate/enforce the non-toxic shot rules for all uses, especially bird dog training
Prioritize and divide values/uses/users amongst units
Educate users regarding funding situation for WDFW lands
Research potential pheasant release sites on private land
Determine 'seasons of use' for diverse users

Honor Farm (Crescent Lake)

Habitat: 350 acres of agricultural fields, owned (?) by Tulalip Tribe

Uses: Pheasant hunting

Proposals: Potential for waterfowl hunting

Public Issues: Improve disabled access for persons in wheel chairs
Add additional restrooms that accommodate the disabled

DT Issues: Our ability to provide pheasant hunting sites

Strategies: Discuss with Tribe their future uses/proposals and how WDFW might integrate with them
Research potential pheasant release sites on private land
Enhance wetland and stream for fish

Snoqualmie Wildlife Area
Citizens Advisory Group Meeting Summary
Tuesday June 6, 2006
6:30-9:30pm, Conway Fire Hall, Conway

Present at Meeting

CAG: Tina Cochran - German Shorthair/Pointer Club
Ed Connor - Skagit Watershed Council
Steve Hinton - Skagit River Systems Cooperative
Martha Jordan - Trumpeter Swan Society
Dick Knight - Skagit Fisheries Enhancement Group (*for Alison Studley*)
Michael Rasch - Bird hunter; fish/wildlife advocate
Tom Rutten - WDFW Land Management Advisory Committee
Albert Vincent, Jr. - Fish and Wildlife Committee for Persons with Disabilities
Sharon Walker – Sno. Co. Parks and Recreation Dept; fish/wildlife advocate

Absent: Kurt Beardslee - Washington Trout
Rone Brewer - Environmental Consultant; fish/wildlife advocate
Virginia Clark - Pilchuck Audubon Society
Marilyn Dahlheim - Dog trainer
Oscar Graham - WDFW Waterfowl Advisory Committee; fish/wildlife advocate
Art Kendal - Wylie Slough Technical Committee; fish/wildlife advocate
Dave Kush – Snoqualmie W.A. volunteer; pheasant hunter
Bob Rose – Skagitians to Preserve Farmland
Keith Wiggers – Skagit Audubon Society
Dallas Wylie - Neighboring farmer

WDFW: John Garrett, Skagit Wildlife Area Manager
Belinda Schuster, Assistant Manager
Curran Cosgrove, Habitat Technician
Donna Gleisner, Technical Writer

Snoqualmie Wildlife Area – Draft Strategies Review

John Garrett discussed current and potential projects to remove fish passage barriers on the Stillwater, Crescent Lake, Cherry Valley and Spencer Island units. It appears that these projects will not negatively impact current pheasant and waterfowl hunting opportunities.

We then went through the Snoqualmie Strategies, typing in everyone's comments and concerns. Again, our main goal this year is to gather general comments, broad level input, reach consensus where we can, and identify which strategies the CAG needs more time to work on. Those strategies will be tagged in the plan as needing more discussion. Then the CAG can prioritize those unresolved strategies and begin working on them one at a time over the next year.

Next Steps

The CAG did not think another meeting was needed to review the final draft of the Snoqualmie Strategies. In lieu of that, they have opted to e-mail each other regarding any further changes and work to get agreement that way.

Donna said she will prepare a list of issues that the CAG is being asked to address for both the Skagit and Snoqualmie Wildlife Areas. (Donna will e-mail this list to everyone later this month.) It will then be up to the CAG to decide which issue to work on first, or split into sub-committees to work on more than one at a time, etc. The CAG will also need to decide when it would like to meet next, where, etc.

THANK YOU ALL for caring enough about our natural resources and recreational opportunities to get involved, and lend your knowledge, energy and creativity. We are looking forward to working with you on some very interesting issues over the next year, and beyond!

APPENDIX 2. SNOQUALMIE WILDLIFE AREA WEED MANAGEMENT PLAN

Weed Control Goals on WDFW Lands

The goal of weed control on Department lands is to maintain and improve the habitat for wildlife, meet legal obligations, provide good stewardship and protect adjacent private lands.

Weed control activities and restoration projects that protect and enhance fish and wildlife populations and their habitats on Department lands are a high priority. When managing for specific wildlife species on our lands, the weed densities that trigger control are sometimes different than on lands managed for other purposes (e.g. agricultural, etc.). For example, if a weed is present at low densities and does not diminish the overall habitat value, nor pose an immediate threat to adjacent lands, control may not be warranted. WDFW focuses land management activities on the desired plant species and communities, rather than on simply eliminating weeds.

Control for certain, listed species is mandated by state law (RCW 17.10 and 17.26) and enforced by the County Noxious Weed Board. WDFW will strive to meet its legal obligation to control for noxious weeds listed according to state law (Class A and B-Designate weeds). Importantly, WDFW will continue to be a good neighbor and partner regarding weed control issues on adjacent lands. Weeds do not respect property boundaries. The agency believes the best way to gain long-term control is to work cooperatively on a regional scale. As funding and mutual management objectives allow, WDFW will find solutions to collective weed control problems.

Weed Management Approach

State law (RCW 17.15) requires that WDFW use integrated pest management (IPM). Integrated pest management defined is a coordinated decision-making and action process that uses the most appropriate pest control methods and strategy in an environmentally and economically sound manner to meet agency programmatic pest management objectives to control weeds. These elements include:

Prevention- Prevention is the process of forestalling the contamination of an area by a noxious weed. It includes measures taken to stop the introduction and spread of a specific species into areas currently infested. This far-sighted approach, similar to preventative medicine, pays great economic and natural resource dividends. Prevention programs are implemented to keep the Wildlife Area free of species that are not yet established, but which are known to be pests elsewhere in the area.

Monitoring- Monitoring is necessary to implement prevention and to document the weed species, its distribution and relative density on the Wildlife Area.

Prioritizing- Prioritizing weed control is based on many factors such as monitoring data, the invasiveness of the species, management objectives for the infested area, the value of invaded habitat, the feasibility of control, the legal status of the weed, past control efforts, and available budget.

Treatment- Treatment of weeds using biological, cultural, mechanical and chemical control serves to eradicate pioneering infestations, reduce established weed populations below densities that impact management objectives for a unit, or otherwise diminish their impacts. Each control method considers human health, ecological impact, feasibility and cost-effectiveness.

Adaptive Management- Adaptive management evaluates the effects and efficacy of weed treatments and makes adjustments to improve the desired outcome for the Wildlife Area. The premise behind a weed management plan is that a structured, logical approach to weed management, based on the best available information, is cheaper and more effective than an ad-hoc approach where one only deals with weed problems as they arise.

Weed Species of Concern on the Snoqualmie Wildlife Area

Weeds of concern on the Snoqualmie include Reed canary grass (*Phalaris arundinacea*), Canada thistle (*Cirsium arvense*), Japanese knotweed (*Polygonum cuspidatum*) and purple loosestrife (*Lythrum salicaria*). This list is based on species that have been documented on the Wildlife Area (Table 8).

Table 8. Snoqualmie Wildlife Area weeds including weed class listing, approximate acres and acres treated in 2005.

Common Name	Scientific Name	State/County Weed Class	Wildlife Unit	Acres	Acres Treated
Butterfly bush	<i>Buddleia davidii</i>	C/C	Stillwater		0
Canada thistle	<i>Cirsium arvense</i>	C/C	Cherry Valley		
			Crescent Lake	>1	Monitor
			Stillwater		
Common tansy	<i>Tanacetum vulgare</i>	C/C	Stillwater		
			Crescent Lake		
English ivy	<i>Hedera Helix</i>	C/C	Crescent Lake		0
Japanese knotweed	<i>Polygonum cuspidatum</i>	B/B	Crescent Lake		0
			Stillwater	1-3	<1
Purple loosestrife	<i>Lythrum salicaria</i>	B/B designation	Cherry Valley	<1	<1
			Crescent Lake		Monitor
			Spencer Island		0
			Stillwater	<1	<1
Reed canary grass	<i>Phalaris arundinacea</i>	C/C	Cherry Valley	>11	
			Crescent lake	>10	
			Spencer Island	>10	
			Stillwater	>25	0
Tansy ragwort	<i>Senecio jacobaea</i>	B/B	Stillwater		
General weeds: Himalayan & Evergreen Blackberry	<i>Rubus discolor</i> <i>Rubus laciniatus</i>	Not listed	Cherry Valley		
			Crescent lake		
			Spencer Island		
			Stillwater		

**Priority status for control by King or Snohomish County Weed Boards*

Management and control recommendations for individual weed species can be found in the following sections, as follows:

BUTTERFLY BUSH CONTROL PLAN

Class C Weed Species

Latin Name: *Buddleia davidii*

Common Name: Butterfly bush

Family: Buddlejaceae/Buddleja Family

DESCRIPTION: Butterfly bush is a large deciduous shrub, growing up to ten feet tall. Leaves are lance-shaped and opposite, up to four inches long and a half-inch wide. While the leaf tops are dark, the undersides appear light due to whitish hairs. Small, fragrant, funnel-shaped flowers are usually purple, although there are also red, pink, blue, orange, yellow and white varieties. Flowers are borne in showy spikes at the ends of stems and bloom from mid-summer into fall. Butterfly bush produces large quantities of wind and water dispersed seeds (up to 3 million seeds per plant), which can remain dormant in the soil for many years. When cut down, the plant resprouts readily from the rootstock and can be propagated through cuttings. Butterfly bush has been noted to reach maturity in less than one year, allowing it to spread quickly.

Origin: Butterfly bush, native to China, has become a very popular garden ornamental in North America. However, it has escaped cultivation.

Habitat: Colonizes disturbed areas such as roadsides and riparian areas. Butterfly bush is very adaptable, growing in most soil types and climates. In the Pacific Northwest, it is a potential problem at higher elevations that have been recently logged.

Threat: This species invades roadsides, riparian areas, pastures, river gravel bars and other disturbed areas. It is noted to form dense thickets and may exclude native vegetation. Although it is touted as a beneficial plant for butterflies, it is not a butterfly host plant and may displace the native plants needed by butterflies for reproduction.

MANAGEMENT INFORMATION:

Biological: There are no biological controls for this species.

Chemical: Butterfly bush can be treated like other woody shrubs with either a cut stump, foliar, or basal bark application of herbicide, such as triclopyr or glyphosate.

Manual: Hand digging is possible for small numbers of plants or seedlings, although soil disturbance will encourage seeds in the soil to sprout. Controlled sites need to be monitored in subsequent years to ensure no new plants become established.

Mechanical: Cutting or mowing could be used to prevent seed production, but plants will continue to grow or will resprout.

CURRENT DISTRIBUTION

Butterfly bush exists on the Stillwater unit with low density and limited distribution.

Acres Affected: ~1	Weed Density: Low
Goals:	Objectives:
-Control expanding populations	-Survey and map existing populations
-Prevent new occurrences	-Calculate the acres affected by this weed
	-Monitor existing populations annually
	-Treat when budget allows

ACTIONS PLANNED

No exact locations or and distribution data are available at this time. Efforts to develop an inventory of existing distribution are underway.

CONTROL SUMMARY AND TREND

No control measures are currently in place but will be developed once more data is available regarding distribution on the site. There is very limited known distribution.

CANADA THISTLE CONTROL PLAN

Class C Designated Weed Species

Latin Name: *Cirsium arvense*

Common Name: Common tansy

Family: Compositae/Aster Family

DESCRIPTION: Canada thistle is a perennial herb that grows one to four feet tall. Stems are slender, green, and freely branched. Leaves are alternate, deeply lobed with stiff yellowish spines on the margins. Purple flowers bloom in late spring into summer. Plants are male or female and grow in circular patches that often are one clone and sex. Female flowers produce a sweet odor. Fruits are about 1/8-inch long, somewhat flattened, and brownish and may produce 1,000 to 1,500 seeds per flowering shoot. This species develops and spreads mainly via vegetative buds (shoots) in its root system, and secondarily via seeds. Horizontal roots may extend 15 feet or more and vertical roots may grow 6 to 15 feet deep. Plants from seed develop roots four feet deep at the end of the first growing season, and flower the second year. Generally, vegetative reproduction contributes to local spread and seed to long distance dispersal. Seed can remain viable in the soil for up to 20 years.

Origin: Early colonists probably introduced this species to North America in the 17th Century, it is native to SE Europe and the eastern Mediterranean.

Habitat: Canada thistle grows in a wide variety of soils and can tolerate up to two percent salt content. It prefers deep, well-aerated cool soils, and is less common in light, dry soils and on wet soils without much aeration. This weed is found in almost every plant community disturbed by humans: roadsides, railway embankments, lawns, gardens, abandoned fields, sand dunes, agricultural fields, forest margins and waterways. Canada thistle is shade intolerant.

Threat: Canada thistle is an aggressive, creeping perennial weed that infests croplands, pastures, rangeland, prairies, streamside areas, roadsides and other disturbed ground. It is an effective competitor for light, moisture and nutrients thereby reducing crop yields, displacing native vegetation, decreasing species diversity, and changing the structure and composition of some habitats. Most alarmingly, this weed has adapted to different environmental conditions, and these plant variations (ecotypes) all respond differently to treatment. Some infestations may be completely controlled by one technique, while others will only be partially controlled because two or more ecotypes are present. Additionally, Canada thistle responds differently under different weather conditions. Therefore it is often necessary to implement several control techniques, and to continuously monitor their impacts.

MANAGEMENT INFORMATION:

Biological: Many insects, a few nematodes, and the American Goldfinch have been reported to feed on various parts of Canada thistle. At least seven insect species have been intentionally or unintentionally released for its control in North America. Only a few of them cause conspicuous damage. A fly, (*Urophora cardui* L.) is the most promising biological control agent. Eggs are laid in the terminal buds and galls develop which divert nutrients and stress the plant. A combination of at least three biocontrol agents, or of biocontrol agents and herbicides, may provide better control than any single agent.

Chemical: Picloram (Tordon 22K), clopyralid (Transline, Curtail), dicamba (Banvel/Vanquish/Clarity) and chlorsulfuron (2,4-D and Telar) are most effective against Canada thistle when combined with manual or mechanical control. Different ecotypes respond differently to the same herbicide, so it is important to vary herbicides to prevent tolerant clones from becoming dominant. For all herbicides except 2,4-D, two or more applications give better control. Herbicide absorption is enhanced in late summer and fall (the rosette stage). Flower-bud stage is second best. Herbicide effect is enhanced when roots are weakened during the growing season by herbicide treatment, crop competition, frequent mowing or tilling; and 2) new shoots are stimulated to grow. Apply herbicide when new leaves are green (September/October).

Manual: Grasses and alfalfa can compete effectively with Canada thistle. Burning may be the least damaging treatment method, because in many habitats it stimulates native vegetation growth, which subsequently competes with the thistle. Combining bio-control and prescribed fire or mowing may help control Canada thistle and promote restoration, but this is still in the experimental stage.

Mechanical: Mowing alone is not effective unless conducted at one-month intervals over several growing seasons. Tilling every three weeks for about four months can control minor infestations. Mowing can be more effective if combined with herbicide treatments.

CURRENT DISTRIBUTION

Canada thistle is currently found on Crescent Lake, Cherry Valley, and Stillwater Units.

Acres Affected: ~1	Weed Density: Medium (large discrete patches)
Goals:	Objectives:
-Control expanding populations	-Survey and map existing and treated populations
-Prevent new occurrences	-Calculate the acres affected by this weed
	-Treat infestation
	-Survey nearby areas for pioneering infestations

ACTIONS PLANNED

Initial control methods will be to mow or disk areas to control expansion of current distribution.

CONTROL SUMMARY AND TREND

Canada thistle will be controlled using a mechanical means at this time. When funding becomes available chemical control methods will be initiated. Monitoring will continue on an annual basis on nearby units.

COMMON TANSY CONTROL PLAN

Class C Weed Species

Latin Name: *Tanacetum vulgare*/

Family: Asteraceae/Aster Family

DESCRIPTION: Common tansy is a perennial herb that grows up to six feet tall. Semi-woody stems are purplish-red near the bottom, hairless or mostly hairless, and extensively branched toward the top. Deep green leaves are 4-8 inches long and 1.5-3 inches wide, dotted with many small glands, deeply divided, fern-like with a very strong smell, especially when crushed. Yellow half-inch flowers that look like buttons (no petals) bloom from July to fall. Numerous flower heads appear in flat-topped, dense clusters. Stems remain erect into the winter, still bearing dried flower heads. Seeds are yellowish-brown with short, five-toothed crowns. While this species spreads mainly by seeds, its extensive root system includes roots can become shoots (rhizomes) to also create new plants. Common tansy leaves, stems and flowers contain alkaloids that are toxic to both humans and livestock if consumed in large quantities. Cases of livestock poisoning are rare, though, as tansy is unpalatable to grazing animals. Common tansy is often confused with another noxious weed, tansy ragwort (kale-like leaves, yellow flowers with about 13 petals).

Origin: Common tansy is native to Europe and has a long history of medicinal use. It was first introduced to North America for folk remedies and as an ornamental plant.

Habitat: This species is an invader of disturbed sites and is commonly found on roadsides, fencerows, pastures, stream banks and waste areas throughout temperate North America.

Threat: Common tansy is a fast-growing, creeping perennial weed that infests croplands, pastures, rangeland, prairies, streamside areas, roadsides and other disturbed ground. It may threaten the ecological health of these areas through reduction in livestock forage, wildlife habitat and species diversity.

MANAGEMENT INFORMATION:

Biological: There are no known biological control agents for this species.

Chemical: The most effective herbicide for control is metsulfuron (Escort). Always use with a high quality, non-ionic surfactant to ensure penetration into plant tissues. This herbicide should not be used where the water table is less than 20 feet deep or near water—it is persistent in soil and could leach into groundwater. Glyphosate (Rodeo) and 2,4-D amine are alternative herbicides for use near water, but they are not very effective for. Best results have been achieved with wipe on application. In one trial, wipe on application of 2,4-D and glyphosate (Rodeo) gave 85 percent and 75 percent control, respectively, after two years. In this same trial, spray on application yielded very poor control.

Manual: Small infestations can be hand dug, although care must be taken to remove all of the tough root system and rhizomes, as root fragments will resprout. Hand pulling is largely ineffective, but if done during the bud stage it will prevent the growth of flowering stalks, limiting seed production and the spread of infestations by seed. Wear gloves and other protective clothing to prevent possible absorption of toxins through skin.

Mechanical: Mowing near waterways marginally controls common tansy. Set mower blades high to limit impacts on desirable species.

CURRENT DISTRIBUTION

Common tansy is currently found on Stillwater unit.

Acres Affected: ~1	Weed Density: Low
Goals:	Objectives:
-Control expanding populations	-Survey and map existing and treated populations
-Prevent new occurrences	-Calculate the acres affected by this weed
	-Treat infestations
	-Survey nearby units for pioneering infestations

ACTIONS PLANNED

No funding is available for actions at this time.

CONTROL SUMMARY AND TREND

Common tansy will be controlled using mowing and clipping since at this time infestation is limited and this is not a priority weed species.

ENGLISH IVY CONTROL PLAN

Class C Weed Species

Latin Name: *Hedera helix*

Family: Araliaceae

Common Name: English ivy

Ginseng Family

DESCRIPTION: English ivy is an evergreen climbing vine. Vines can grow 30 feet a year and can reach the tops of 300-ft tall conifers. Older vines can be a foot in diameter. Leaves are dark green, waxy, somewhat leathery. Most common is a 3-lobed leaf with a heart-shaped base. Leaves in full sun are often unlobed, oval with wedge-shaped bases. Umbrella-like clusters of small, greenish-white flowers appear in the fall with sufficient sunlight. Black fruits mature in spring with a fleshy covering enclosing 1-3 hard, stone-like seeds. The seeds may cause vomiting, diarrhea, nervous conditions and dermatitis in some people. Ivy has two distinct growth phases, the immature vegetative stage, where the plant grows rapidly and tends to sprawl across the ground, and the mature fruiting stage, which typically occurs on climbing plants, but may also occur on prostrate patches of sufficient age, especially in full sunlight. Because these patches may form thick mats, the ivy essentially climbs on itself to produce upright, fruiting stems.

Origin: Colonial settlers brought English ivy to North America; it was a native to Europe, western Asia, and northern Africa.

Habitat: English ivy grows easily in many types of soil, from full sun to complete shade, and once established, is fairly drought tolerant. In the Pacific Northwest, it grows up to about 3,000 feet. English ivy infests woodlands, forest edges, fields, hedgerows, coastal areas, salt marsh edges, and other upland areas, especially where some soil moisture is present. It does not grow well in extremely wet conditions and is often associated with some form of land disturbance, either human-caused or natural.

Threat: English ivy is an aggressive invader that threatens nearly all forested habitat types in the northwestern U.S. up to at least 3000' in elevation. Capable of ground as well as upper forest canopy growth, its density and abundant leaves form a thick canopy that prevents sunlight from reaching other plants and slowing kills or topples host trees within five years. English ivy also serves as a reservoir for a plant pathogen that harms native trees. Because of its great potential to fundamentally change Pacific Northwest forested habitats, English ivy can fairly be called the kudzu of the Pacific Northwest. Areas dominated by ivy have lower diversity of birds, mammals and amphibians, and appear to be good habitat only for rats.

MANAGEMENT INFORMATION:

Biological: There are no biological controls currently available for English ivy.

Chemical: The literature reports mixed, but usually incomplete, control with growing season applications of various herbicides including triclopyr (Garlon 3a and in many "shrub-killers"), glyphosate (Round-up, Rodeo, Aquamaster, Gly Star) and 2-4 D. The waxy layer on leaves appears to limit many herbicides, especially glyphosate, from effectively permeating the leaves. However, under some circumstances herbicides can provide safe and effective control of ivy, even when applied during winter. Spray late enough in the late fall/early winter to ensure that most native species are dormant, but soon enough that they are not close to bud break (December to mid-

January, with late January - early February as a fall back). This timing also allows time for ivy leaves to reappear after being temporarily buried by fall leaf drop.

Manual: Groundcover vines can be pulled up by hand, and left on-site or bagged and disposed of as trash. Remove as much of the root system as possible, minimize trampling and churning of the soil, and clear an area thoroughly before moving on. Vines on trees should be cut at a comfortable height to kill upper portions and relieve the tree canopy. Use a large screwdriver or forked garden tool to pry and snap vines away from the tree trunks. Cut thicker vines with an axe or pruning saw. Rooted portions of vines will remain alive and should be pulled, and repeatedly cut. Because cutting will likely promote further growth from the base, vigilance is required to ensure long-term control.

CURRENT DISTRIBUTION

English ivy currently exists on the Crescent Lake unit.

Acres Affected: ~1	Weed Density: Low
Goals:	Objectives:
-Control expanding populations	-Survey and map existing populations
-Prevent new occurrences	-Calculate the acres affected by this weed
	-Monitor existing populations annually
	-Treat when budget allows

ACTIONS PLANNED

Monitoring will continue on an annual basis.

CONTROL SUMMARY AND TREND

Monitoring will continue on an annual basis. Manual removal from around some tree bottoms occurred in 2005.

HIMALAYAN BLACKBERRY CONTROL PLAN

Unlisted Weed Species

Latin Name: *Rubus discolor/armeniacus* **Common Name:** Himalayan blackberry

Family: Roseaceae/Rose Family

DESCRIPTION: Himalayan blackberry (HBB) is a robust, sprawling perennial, more or less evergreen, shrub. Leaves are large, round to oblong and toothed, and usually in groups of five. Stout, thick, arching stems (canes) have large, stiff thorns. Shrubs first appear as individual canes, then groups of canes, gradually increasing to become great mounds or banks, with individual canes reaching up to nine feet. The main cane grows up to 15 feet tall; trailing canes spread up to 20-40 feet, frequently taking root at the tips. Small white to pink flowers appear in spring and then round, black edible fruits form in mid-summer to early August. Individual canes live only two to three years; yet reach a density of 525 canes per square yard. Roots penetrate down about 3 feet, and can be 30 feet long. HBB also expands its grow area vegetative means by root and stem fragments. Seeds remain viable for several years.

Origin: Native to Western Europe, this weed was probably first introduced to North America in 1885 as a cultivated crop. By 1945 it had naturalized along the West Coast.

Habitat: Himalayan blackberry tolerates a wide range of soils and moisture conditions, but not true wetland soils. It prefers full sun and well-drained soils. It is found in vacant lands, pastures, open forests, tree farms, roadsides, creek gullies, riparian areas, fence lines and right-of-way corridors.

Threat: Once it becomes well established, HBB out competes any low growing native vegetation and can prevent shade intolerant trees from growing, leading to permanent HBB thickets with little other vegetation present. These dense, impenetrable thickets limit the movement of large animals. When this species takes over entire stream channels and banks, it increases the possibility of flooding and erosion there.

MANAGEMENT INFORMATION:

Control is best done in two phases: 1) remove above ground vegetation, and 2) kill/remove root crowns and major side roots (not necessarily in that order).

Biological: The USDA has not supported the introduction of herbivorous insects to control HBB due to the risk these insects may pose to commercially important *Rubus* species. Research on this subject continues.

Chemical: Herbicides such as triclopyr (Garlon 3a and 4), glyphosate (Roundup, Rodeo) or 2,4-D with triclopyr (Crossbow) deliver effective control when applied to mature, uncut canes in late summer/fall or to cut/resprouted stems in fall. Picloram and 2,4,5-T are not considerably more effective than cane removal. All standing, dry, hard canes need to be removed for effective restoration.

Manual: Removing root crowns and major side roots by hand digging (claw mattock, pulaski/mattock) is a slow but sure way to destroy blackberry (especially small patches). You must be thorough and follow up because large root fragments left in soil may produce a new plant.

Starting with lesser weed infestations and working towards the worst stands is effective at maximizing self-recovery of native vegetation. Or immediately seed with native grasses to reduce invasion by other weeds and allow follow-up treatment of surviving HBB with broadleaf killing herbicides (if desired). Remove canes and fragments to prevent resprouting. Although fire alone doesn't control this weed, burning large infested areas will remove standing mature plants after a pre-spray of herbicide(s) to kill and desiccate aboveground portions. Planting fast-growing shrubs or trees or shade tolerant species may reduce or prevent HBB re-establishment, since the species is usually intolerant of shade. Grazing sheep and goats where mature plants have been removed has also controlled regrowth, but both are non-selective eaters.

Mechanical: Mowing and weed whacking (blade better than string) can be very effective in controlling HBB. Several cuttings are required before the underground parts exhaust their reserve food supply. If only a single cutting can be made, do it when plants begin to flower. Debris may be fed through a mechanical chipper and used as mulch. Need to follow-up the next year, as HBB may resprout from root crowns in greater density (and overtop any planted vegetation).

CURRENT DISTRIBUTION

Himalayan blackberry is so widespread and rampant throughout Washington that it was not added to the state's noxious weed list because control would be almost impossible at that scale. This weed is currently found on all units in small to large patches, and is especially thick along access roads and field edges.

Acres Affected: Unknown	Weed Density: High
Goals:	Objectives:
-Control expanding populations	-Survey and map existing populations
-Prevent new occurrences	-Calculate the acres affected by this weed
	-Monitor existing populations annually
	-Treat when budget allows

ACTIONS PLANNED

Himalayan blackberry, although not on the state or county noxious weed list, is a serious habitat problem on many of the Snoqualmie Wildlife Area units. Monitoring will continue on an annual basis.

CONTROL SUMMARY AND TREND

Mechanical methods of control will be used as a part of standard mowing program. Chemical and other mechanical methods will be considered as a part more comprehensive habitat restoration funding plan.

JAPANESE KNOTWEED CONTROL PLAN

Class B Noxious Weed

Latin Name: *Polygonum cuspidatum*

Common Name: Japanese knotweed

Family: Polygonaceae/Buckwheat Family

DESCRIPTION: Japanese knotweed is an herbaceous perennial that forms large clumps three to 10 feet tall. Leaves are two to six inches long and heart shaped, but hybrids blur these distinctions. The hollow, upright, bamboo-like stems are often reddish or red-speckled; young shoots look similar to red asparagus. Small greenish-white flowers form in July and August, growing in dense clusters from leaf joints. Male flowers are upright; female flowers droop. Although the plant dies back to the ground after hard frosts, bare, reddish brown stalks may persist through the winter. While it can reproduce by seed, primary reproduction is through an extensive network of rhizomes that can spread 20 to 65 feet from the parent plant and penetrate seven feet into the soil. Shoots generally emerge in April and can grow more than three inches a day. Root and stem fragments as small as one-half inch can form new plant colonies. Dispersal can occur naturally when rhizome fragments are washed downstream by currents or floods and deposited on banks or more commonly, when soil is transported as fill dirt. Many patches in the Pacific Northwest appear to be hybrids of Japanese and giant knotweed (*Polygonum X bohemicum*).

Origin: Native to eastern Asia, it was introduced to the United Kingdom as an ornamental in 1825, and from there to North America in the late nineteenth century.

Habitat: Japanese knotweed is found primarily in moist, open habitats with no shade in regions of high precipitation. It will grow in silt, loam, sand and river cobble with pH ranging from 4.5 to 7.4. Its distribution appears to be limited by light as its growth and abundance are depressed in shady locations. It spreads primarily along riverbanks, but also grows in wetlands, irrigation canals, ditches, waste places, along roadways, and in other disturbed areas.

Threat: Because the Pacific Northwest has so many streams, rivers and associated riparian areas, seasonal flooding constantly spreads small knotweed fragments to new areas where they easily and quickly take hold. Then knotweed's early emergence and great height combine to shade out other vegetation and prohibit native plants and other weed species from growing. It reduces species diversity and destroys critical fish and wildlife habitat. These stem and root fragments (also spread in contaminated fill material) can regenerate when buried three feet deep and grow through two inches of asphalt.

MANAGEMENT INFORMATION:

Biological: Research has only recently begun on biological control. The genetic uniformity of this species makes it a good candidate for biological control, but it may be years before a successful control agent can be found.

Chemical: Glyphosate (Aquamaster, Rodeo, Roundup) is effective on first year plants and sprouts from nodes. Cut or mow plants in spring, then apply in June or July when plants are 3-6 feet tall. Repeated applications over several years may be necessary, especially for large patches. Tests with triclopyr (Garlon 3A) killed 100 percent within two years; Rodeo typically takes three years. Picloram (Tordon) applied in the spring is also recommended, but not near water. Dicamba has also

been effective, but is persistent in the soil and nonselective. Other herbicides are those with 2,4-D, imazapyr (Arsenal) or picloram (Tordon). Although some glyphosate products control with one or two treatments in some cases, frequently several badly mutated stems from each clump survive and must be retreated. Herbicides appear to be more effective when combined with cutting. Digging, pulling or tilling (if conditions warrant) before August and at least one month prior to spraying may also help by increasing the shoot to root ratio and reducing plant vigor and root mass, thereby increasing plant susceptibility to the herbicide.

Manual: No research has been done on burning plants, but it may also remove above ground plant material. Goats are reported to eat knotweed and in some circumstances controlled grazing may be an option similar to intensive mowing.

Mechanical: Thorough and persistent cutting TWICE A MONTH over several years can eliminate knotweed (especially small, isolated patches) as this reduces rhizomatous reserves. Prevent the plants from ever exceeding six inches tall. Remove, rake or carefully dry all knotweed vegetation, because stems or stem fragments can sprout.

CURRENT DISTRIBUTION

Japanese knotweed is currently found in large patches on the Stillwater unit.

Acres Affected: Unknown	Weed Density: High (widely scattered)
Goals:	Objectives:
-Control expanding populations	-Survey and map existing and treated populations
-Prevent new occurrences	-Calculate the acres affected by this weed
	-Treat accessible infestations
	-Survey nearby units for pioneering infestations

ACTIONS PLANNED

No exact location and distribution data are available at this time. Efforts to develop an inventory of existing distribution are underway. The portions of Stillwater across Harris Creek has limited access by footbridges and therefore have not been adequately treated. Efforts to improve access are currently underway.

CONTROL SUMMARY AND TREND

Control efforts began as early as 98 and monitoring has continued on an annual basis. Expansion and coordination of control program will be discussed with King County Surface water management.

PURPLE LOOSESTRIFE CONTROL PLAN

Class B-designated Noxious Weed

Latin Name: *Lythrum salicaria*

Common Name: Purple Loosestrife

Family: Lythraceae/Loosestrife Family

DESCRIPTION:

Purple loosestrife is a perennial, emergent aquatic plant with a woody taproot, often growing six to ten feet tall and five feet wide. The narrow oblong leaves are 1.5 to four inches long, smooth, and opposite or whorled. Magenta flowers appear from July to early October on long, showy spikes. Each mature plant can produce 2.7 million pepper-sized seeds that can remain in the soil for years. Most seeds germinate in high densities (about 1,000 to 2,000/sq. foot) around the parent plant and flower eight to ten weeks later. Purple loosestrife also spreads by vegetative means, thanks to substantial root wads with buds that can become shoots or roots.

Origin: Probably Europe and Asia. During the mid 1900's the nursery industry developed and sold plants thought to be sterile. Of the 12 species in the continental U.S., three are exotic (introduced).

Habitat: Purple loosestrife occurs in freshwater and brackish wetlands, cattail marshes, sedge meadows, open bogs, ditches and other wet disturbed soil areas, and along lakes, streams and rivers. It tolerates a broad pH range (4.0 and 9.1) and grows best in high organic soils, but tolerates clay, sand, muck and silt. Generally found in full sun, it can survive in half shade.

Threat: With its ability to produce prolific amounts of seeds and spread vegetatively from root buds and stem pieces, this species is highly invasive, competitive and long-lived (up to 20 years). It is an extremely successful and sudden invader of disturbed wetlands due to its massive seed bank, outcompeting all native seedlings and severely altering wetland ecosystems. It displaces native plants; nesting and feeding habitat for waterfowl, fur-bearing animals and other bird populations; reduces recreational hunting and trapping grounds; and decreases land values. Purple loosestrife also invades and clogs irrigation systems (costing millions annually to fix) and overtakes wild meadows, hay meadows and wetland pastures used for grazing.

MANAGEMENT INFORMATION:

Biological: Leaf-feeding beetles (*Galerucella californiensis* and *G. pusilla*) may provide long term success. These beetles defoliate and attack the terminal bud area, drastically reducing seed production and leaving a high seedling mortality rate (nearly 50 percent). A root-mining weevil (*Hylobius transversovittatus*) that also eats leaves and severs xylem and phloem tissue (depleting carbohydrate reserves) greatly reduces plant size. Other possible agents include a seed-eating beetle (*Nanophyes marmoratus*) that reduces seed production by 60 percent, another (*N. brevis*) that attacks seed capsules, and a cecidomyiid fly whose galling can reduce the foliage by 75 percent and seed production by 80 percent.

Chemical: Glyphosate (AquaNeat, AquaMaster) are the herbicides labeled for aquatic use in Washington and provide good control if applied in July and August; however they non-specific. For larger infestations where selective application of glyphosate is not practical, broadleaf herbicides (Triclopyr and 2,4-D based) are also effective, if applied in late May to early June. A combination of 2,4-D and dicamba (1:1 tank mix) has been used on a limited basis in western

irrigation ditches. Spray loosestrife at 10-15 percent of its mature growth for good results and repeat once during the growing season.

Manual: Flooding plants for five weeks can produce 100 percent mortality, but all growth must be underwater. This is only recommended for large infestations because of problems maintaining constant water levels and harm to native plants. If possible, delay drawdowns until mid-July, after growing season has peaked. Mature flowering stems of small infestations can be cut at the base in late summer or early fall bagged and disposed of to prevent seed production. Black plastic covering is an interim option for dense seedling infestations, slowing growth and seed production. However, root crowns did die in plots where heavy litter from mowing remained covered until the next June. More study needed.

Mechanical: While mowing alone is not a viable control option, doing so late in the season reduces shoot production more than mid summer cutting. Where disturbance to soil and plants is acceptable, tilling the top six inches of soil with disc or harrow can effectively grub out the root crown where the plant's energy is stored.

Replacement: A very limited application, but replacement seeding may be useful to control or contain loosestrife populations on buffer property. Trials with Japanese millet (*Echinochloa frumentacea*) and knotweed (*Polygonum lapathifolium*) sown immediately after marsh drawdown successfully outcompeted loosestrife seedlings. However, the millet didn't regenerate well and has to be replanted every year. The following spring loosestrife grew first due to its over-wintering rootstock.

CURRENT DISTRIBUTION

Purple loosestrife was first observed in 1929 from Lake Washington. Purple loosestrife is currently found in small patches on three units: Stillwater, Spencer Island and Cherry Valley.

Acres Affected: 1+	Weed Density: Low (widely scattered)
Goals:	Objectives:
-Control expanding populations	-Survey and map existing and treated populations
-Prevent new occurrences	-Calculate the acres affected by this weed
	-Treat X % of infestations
	-Survey nearby units for pioneering infestations

ACTIONS PLANNED

Area has limited purple loosestrife continue to treat and monitor known locations and inventory other sites with limited access.

CONTROL SUMMARY AND TREND

In 2006, the Stillwater and Cherry Valley units will be surveyed and spot treated in spring/early summer using herbicide. These two units were treated in the summer of 2005.

Monitoring will continue on an annual basis on nearby units.

REED CANARYGRASS CONTROL PLAN

Class C Noxious Weed

Latin Name: *Phalaris arundinacea*

Common Name: Reed Canary grass

Family: Gramineae/Grass Family

DESCRIPTION: Reed canary grass is a perennial grass that can grow three to six feet tall. The sturdy, often hollow stems can be up to 1/2 inch in diameter, with some reddish coloration near the top. Leaf blades are flat and hairless, 1/4 to 3/4 of an inch wide. In June and July flowers are borne on the top three to six inches of a stalk that is held high above the leaves. Reed canary grass can spread by seeds or creeping rhizomes (roots that sprout shoots) and will also produce roots and shoots from the nodes of freshly cut stems. However, it is shallow-rooted—only two to eight inches deep.

Origin: While possibly native to North America, it is very likely that the reed canary grass found in wet places today is a European cultivar specifically bred for its growth and vigor, and widely introduced starting in the 1900s. In some areas, this grass has also been used for erosion control.

Habitat: A wetland plant, this species typically occurs in soils that are saturated or nearly saturated for most of the growing season. Established stands can tolerate extended periods of inundation. It does not survive in deep shade or dry uplands, but can tolerate prolonged drought.

Threat: Reed canary grass is extremely aggressive and often forms persistent monocultures in wetlands and along rivers and streams. Infestations threaten the diversity of these areas, since the plant chokes out native plants and grows too densely to provide adequate cover for small mammals and waterfowl. The grass can also lead to increased siltation along drainage ditches and streams. Once established, reed canary grass is difficult to control because it spreads rapidly by rhizomes.

MANAGEMENT INFORMATION:

Biological: There are no known biological control agents for reed canary grass.

Chemical: Glyphosate (Rodeo, Aquamaster, Glypro), amitrol, dalapon, and paraquat have all been tried with some success. Mowing plants down to 3 feet or less and then spraying at flowering time (late summer to early fall) produced effective control. Only glyphosate (Rodeo) is licensed for use in aquatic systems in Washington. Applying Rodeo, followed in two to three weeks by prescribed burning has also been effective. Sethoxydim (Vantage) is a grass-specific herbicide used with some success in the Pacific Northwest, but not labeled for aquatic use.

Manual: The following covering/mulching techniques can eliminate reed canary grass: using a thick woven geotextile shade cloth, applying several layers of cardboard covered by 4-6 inches of wood mulch, using a thick woven plastic fabric (Mirafi or Amoco brands) held in place by 7-inch gutter spikes, washers and duck-bill tree anchors, or even rubber, road felt and other thick materials that keep out light. Keep the covering firmly in place for over one year (over an entire growing season), even under water, to kill all plants. Re-vegetation or reseeding is generally necessary. Mowing plants close to the ground prior to applying any covering greatly helps. Flooding an area with more than 5 feet of water for at least three growing seasons has successfully eliminated this weed. While burning generally does not kill mature reed canary grass, prescribed fire can be a

pretreatment to tillage, shade cloth, or herbicide application with good results, since fire will remove dead litter and standing vegetation. Planting native trees and shrubs in weed-infested circles or blocks (that have been killed by herbicide) can produce shade and weaken the vigor and growth of adjacent reed canary grass patches over time.

Seeding an area with competitive grass species, such as tufted hairgrass (*Deschampsia cepitosa*), slough grass (*Beckmannia syzichachne*), bentgrass (*Agrostis spp.*) or turf-forming varieties of red fescue (*Festuca rubra*), may prevent significant establishment of canary grass seeds.

Mechanical: Mowing multiple times per year (early to mid-June and early October) may be a valuable control method, since it removes seed heads before they mature and exposes the ground to light, which promotes the growth of native plant species. Cutting, disking or plowing as the plants are coming into flower can also control this weed.

CURRENT DISTRIBUTION

Reed canary grass is currently found in large areas on the Cherry Valley, Stillwater and Spencer Island Units.

Acres Affected: 200+	Weed Density: High (large patches)
Goals:	Objectives:
-Control expanding populations	-Survey and map existing and treated populations
-Prevent new occurrences	-Calculate the acres affected by this weed
	-Treat infestations
	-Survey nearby units for pioneering infestations

ACTIONS PLANNED

Current actions are to continue mowing program to make fields available for dog training and pheasant release program.

CONTROL SUMMARY AND TREND

In 2006, portions of the Cherry Valley and Stillwater units will be mowed to provide trails and fields for bird dog training and field trials. Efforts to control Reed canary grass are not currently been discussed. Habitat enhancement and restoration projects are in the early development stages and have the potential to improve habitat diversity. RCG distribution on Spencer Island will be impacted by estuary restoration project. Monitoring and plan development will continue on an annual basis on nearby units.

TANSY RAGWORT CONTROL PLAN

Class B designate Noxious Weed

Latin Name: *Senecio jacobaea*

Common Name: Tansy ragwort

Family: Compositae/Aster Family

DESCRIPTION: Tansy ragwort is a biennial herb, germinating in the fall, flowering and producing seed in its second year, and then usually dying. In the first year plants have a basal rosette of dark green, deeply lobed, ruffled leaves that are whitish green underneath. The leafy flower stalk shoots up 2-4 feet during the second year, beginning in late June. The yellow, daisy-like flowers grow in flat-topped clusters from July through October, and the seeds mature and disperse during the flowering season. On average, about 150,000 seeds are produced per plant. Most seeds travel less than ten feet from the parent plant. Some lie dormant in the soil for up to 15 years.

Origin: This species is native to Europe and western Asia and has become a serious rangeland pest in New Zealand, Tasmania, Australia, South Africa, and North and South America. It is now widespread west of the Cascade Mountains.

Habitat: Tansy ragwort prefers full sun and open sites with moderately moist to dry soils. However, it can survive under most soil moisture conditions and over winters successfully where temperatures even reach below freezing. Ragwort needs some kind of disturbance to become established, such as moles, gophers, ants, rabbits, livestock or humans. It then easily grows in any disturbed area, such as roadsides, pastures and recently cleared forested sites.

Threat: All parts of tansy ragwort are poisonous to animals and people, and lethal to cattle and horses. Chronic, cumulative poisoning and irreversible liver damage (including cirrhosis of the liver) are the results. These toxic properties remain in cut plants found in hay.

MANAGEMENT INFORMATION:

Biological: The ragwort flea beetle (*Longitarsus jacobaeae*), the ragwort seed fly (*Pegohylemyia seneciella*), and the cinnabar moth (*Tyria jacobaeae*) are all found in western Washington, and are used to control tansy ragwort. The cinnabar moth is most effective in heavily infested areas while the ragwort seed fly has been ineffective by itself. The flea beetle can reduce ragwort populations by 90 percent within five to six years. These three biological control agents compliment one another by targeting different plant parts. The cinnabar moth eats primarily summer foliage, the flea beetle eats the root crown in winter, and the seed fly eats the seeds in summer. The combined pressure of these three insect species should have greater control than any of them alone.

Chemical: Tansy ragwort can be controlled chemically with 2,4-D, dicamba, or a combination of the two. Single applications do not control this weed. 2,4-D is most effective when applied to seedlings and first year rosettes or second year plants prior to bolting. Following bolting, a combination of 2,4-D and dicamba is more effective; it does not eliminate seed production but does reduce viability if sprayed in the early bud stage and prevents viability if sprayed in the late bud/early flowering stage.

Manual: Hand pulling is an effective method of eliminating ragwort, especially if it is done when soils are moist and the hole left after pulling is mulched. Mulching creates an unsuitable habitat for ragwort germination by removing necessary light. Pulling is most often used only after the population has been brought under control and is most effective on small infestations. Grazing with sheep before tansy flower heads bolt can also keep this species under control. Continuous heavy grazing will prevent flowering and, in many cases, reduce density. However, sheep eat most herbaceous plant species, and their feeding and bedding down will leave openings in vegetation. If there is an abundant ragwort seed bank, these openings will allow them to reestablish. Digging up the whole plant, including the roots is also effective. Flowers will go to seed after pulling so be sure to bag and discard the flower stalks. There are no data available to judge the effectiveness of prescribed fire as a control for ragwort. Observations suggest that fire actually increases ragwort abundance.

Mechanical: Thorough plowing each year can kill most established plants, prevent seed production and exhaust the seed supply in the soil. Cutting or moving is only recommended where plants will soon be eradicated. Although mowing can prevent flowering (if done more than once) it appears to increase rosette density, rather than reduce it.

CURRENT DISTRIBUTION

Tansy ragwort is believed to exist in small patches on the Stillwater unit.

Acres Affected: 1+	Weed Density: Low (widely scattered)
Goals:	Objectives:
-Control expanding populations	-Survey and map existing and treated populations
-Prevent new occurrences	-Calculate the acres affected by this weed
	-Treat X % of infestations
	-Survey nearby units for pioneering infestations

ACTIONS PLANNED

A few individual plants have been observed, but the exact location and distribution data are not available at this time. Efforts to develop an inventory of existing distribution are underway.

CONTROL SUMMARY AND TREND

In 2006, the Stillwater unit will be surveyed to determine extent and distribution of tansy ragwort. Monitoring will continue on an annual basis. Cinnabar moths have been observed on the site.

GENERAL WEED CONTROL PLAN

Scientific name: *Many*

Common name: General Weeds

DESCRIPTION: General weeds are described as mixed vegetation both herbaceous and woody that interfere with agriculture, restoration, or recreational activities, where identifying plants to individual species for control is not appropriate. Primary locations for general weeds occur in unmanaged areas along roadsides, dikes, parking areas, trails, and structures and would include species like blackberry, alders and thistles, etc. General weeds may also occur in agricultural fields, or comprise the dominant vegetation at a site identified for habitat restoration and includes species like spotted knapweed, reed canary grass, common tansy, bindweed, thistle, etc.

MANAGEMENT INFORMATION:

Herbicide can be an effective tool for control and applicators should refer to the Pacific Northwest Weed Management Handbook, or other reputable resources, for product recommendations and timing depending on the weed and desired management objectives.

Mechanical weed control may include mowing, burning, to the plowing and disking entire fields.

CURRENT DISTRIBUTION

All public accesses and roadsides on the Wildlife Area contain general weeds to varying degrees. Several agricultural fields at the Cherry Valley and Stillwater Units are comprised of general weeds that are dominated by reed canary grass.

Acres Affected:	Weed Density: L/M/H
Goals:	Objectives:
- Maintain public access	Treat high public use areas with mowing to decrease seed production.
- Restore native vegetation	Treat high public use areas with mowing to decrease seed production.
Improve habitat diversity	Develop general weed management plan as integrated weed plan as a part of habitat restoration/enhancement effort. Summer fallow fields in second phase of restoration.
Restore agricultural fields	

ACTIONS PLANNED

In the spring and summer of 2006, problematic portions of roadsides, parking lots, access sites, and trailheads will be mowed to decrease the production and spread of weed seeds and improve appearance and public access for the entire season.

CONTROL SUMMARY AND TREND

Specific information about general weed trends on the Snoqualmie wildlife area is unknown. Due to staff limitations previous weed control activities focused on maintenance of trails, and fields for public access (dog trials). Much of this work was done with contract mowing and spraying. Efforts to develop integrated weed management programs to include other mechanical and

chemical techniques will be investigated. Trails, roadside and access management require a consistent, yearly maintenance effort.

APPENDIX 3. SNOQUALMIE WILDLIFE AREA FIRE CONTROL PLAN

Responsible Fire-Suppression Agencies

The Snoqualmie Wildlife Area and its satellite units fall under the jurisdiction of local fire districts in King and Snohomish counties (see Table 9). A small portion of some units may fall within the State Fire Protection Boundary as well, under the jurisdiction of the Department of Natural Resources. That agency is the state's largest on-call fire department with 1,200 temporary and permanent employees who fight fires on about 12.7 million acres of private and state-owned forest lands. It also offers local fire districts support with fire protection and safety equipment requirements.

Table 9. County Fire Districts. In case of fire, Dial 911 FIRST

Unit Name	Fire District	Work Phone	City
Cherry Valley	King Co. #45	425-788-1625	Duvall
Corson	Snohomish Co. #8	425-334-6981	Everett
Crescent Lake	Snohomish Co. #3	360-794-7666	Monroe
Ebey Island	N/A		
Spencer Island	N/A		
Stillwater	King Co. #10	425-392-3433	Issaquah

Fires that occur within the local fire districts (non-timbered areas of the Wildlife Area) are the responsibility of the local fire districts, but in case of fire, dial 911 first. Fires that occur within the state fire protection boundary are the responsibility of the Department of Natural Resources and they need to be contacted first. Therefore, depending upon where the fire occurs, the appropriate agency must be contacted first, followed by an immediate call to other jurisdictions adjacent to the fire. In some cases, where there are multiple landowners or fire responders, fire suppression activities may involve two or more fire fighting agencies.

While some fire districts still cover vast areas of agricultural and unpopulated territory, most now provide sophisticated services often used by cities. Fire districts are individual entities, and basic support is entirely from taxes, up to \$1.50 per thousand of the owner's property valuation. Additional funds can be obtained through bonds, special levies or various fees, including fire permit fees and charges for specific services.

Suppression on WDFW forestlands within the state fire protection boundary is performed by Department of Natural Resources. WDFW pays an assessment fee for each acre within the fire protection boundary for these services. In Western Washington, a parcel up to 50 acres pays the minimum assessment of \$14.40. For parcels over 50 acres, the minimum assessment is charged plus \$0.29 per acre for each acre over 50 (2004 rates). The Forest Fire Protection Assessment is levied on all forest and unimproved land. If a wildfire starts, Department of Natural Resources is there to suppress that fire at no additional cost to the landowner if negligence is not involved.

Department Fire Management Policy

It is the Department's policy that Wildlife Area staff are not firefighters and should not fight fires. While Wildlife Area staff are trained in fire fighting and fire behavior, they will only provide

logistical support and information regarding critical habitat values to the Incident Commander of the responding fire agency.

Wildlife Habitat Concerns

The Snoqualmie Wildlife Area contains some the only remaining river valley and estuary habitats existing in a relatively natural state in the Snohomish Watershed. These are important nesting and feeding habitats for great blue heron, waterfowl, forest grouse, hawks and eagles, and most recently, roosting and feeding habitat for swans.

Aerial Support

The Department recommends that fire-fighting entities suppress fires on the Snoqualmie Wildlife Area as rapidly as possible. WDFW requests the Incident Commander to seek aerial support if needed to extinguish a fire on its land promptly. If, in the professional judgment of the Incident Commander, a fire on lands adjacent to the Wildlife Area causes an immediate threat to the area, WDFW requests that he/she seeks aerial support as possible.

Reporting

Report any fire on or adjacent to all units of the Snoqualmie Wildlife Area by dialing 911 FIRST, then contacting the local fire district and the Department of Natural Resources (see Table 10). Contact the numbers listed below IN THE ORDER listed and request the Operations or Staff Coordinator. It is absolutely critical that any fire on the Wildlife Area is fought as aggressively as possible during the initial attack. The importance of aerial support cannot be overstated.

Table 10. Department of Natural Resources Contacts

Name	Phone	Unit
NW Region, Sedro Woolley (Snohomish County units)	360-856-3500	Corson, Crescent Lake, Ebey Island, Spencer Island
S. Puget Sound, Enumclaw (King County units)	360-802-7058	Cherry Valley, Stillwater
DNR Dispatch (after hrs) Olympia	1-800-562-6010	All

The following table (Table 11) provides the telephone numbers -- IN PRIORITY ORDER -- of Washington Department of Fish and Wildlife staff to be contacted in the event of a fire on the Snoqualmie Wildlife Area.

Table 11. Department of Fish and Wildlife Contacts, in priority order

Name/Position	Work Phone	Cell Phone	Home Phone
John Garrett Snoqualmie W.A. Manager	360-445-4441	360-333-8125	360-445-5354
Belinda Schuster Assistant Manager	360-445-4441	360-333-2131	360-336-3219
Curran Cosgrove Habitat Technician	360-445-4441	425-330-7725	360-333-0833

<i>For King County units:</i>			
Lance Stevens Wildlife Agent	State Patrol Dispatch	425-466-8584	425-489-7834
Kim Chandler King County Sergeant	425-775-1311, ext 122	206-300-5616	425-821-5465
<i>For Snohomish County units:</i>			
Julie Pinasco Wildlife Agent	State Patrol Dispatch	425-231-6593	360-563-0319
Randy Lambert Snohomish County Sergeant	425-775-1311, ext 123	425-501-3530	360-794-6915
Regional Office, Mill Creek	425-775-1311	N/A	N/A
Lora Leschner Wildlife Program Manager	425-775-1311, ext 121	425-231-7618	360-435-3158

APPENDIX 4. SKAGIT WILDLIFE AREA WATER RIGHTS RECORDS

File #	Cert #	Stat	Doc	Priority Date	Purpose*	Qi+	UOM	Qa+	Irrig Acres	WRIA	TRS	QQ/Q	Src's	1stSr	Comments
S1-00359CWRIS	S1-00359 C	A	CERT	4/21/1970	FS,WL	0.60	CFS			7	26.0N 0.70E 07	SW	2	Unnamed stream	Cherry Valley Unit
S1-00359CWRIS	S1-00359 C	A	CERT	4/21/1970	FS,WL		CFS			7	26.0N 0.70E 07	SW		Unnamed stream	Cherry Valley Unit
S1-111610CL		A	Claim L		No ID				82	7	29.0N 05.0E 15	SE/NW	1	Tide gate	Spenser Island Unit

*DG=Domestic Ground; IR=Irrigation; ST=Stock
 +Qa=Annual quantity; Qi=Instantaneous quantity

APPENDIX 5. SNOQUALMIE WILDLIFE AREA FLOOD AWARENESS AND EVACUATION PLAN

The Snohomish River system, with its multitude of large river and small stream tributaries, is the second-largest drainage system in the Puget Sound region; only the Skagit River system is larger. It includes approximately 1,730 rivers and streams providing more than 2,700 linear miles of drainage. The main-stem Snohomish River is 23 miles long. It originates south and east of Everett at the confluence of its two major tributaries, the Snoqualmie and Skykomish rivers near Monroe, and drains into Puget Sound immediately north of Everett. Its drainage basin extends from 8'000 feet in the Cascade Mountains to sea level at Everett. Tidal action also affects river stages in the lower 13 miles. The river's average gradient is approximately one foot per mile. At bank-full conditions, the width of the river channel varies from 35 to 500 feet.

The Skykomish River basin drains 844 square miles. Principal tributaries to the Skykomish include Woods Creek, the Sultan River, Wallace River, and the North and South Forks of the Skykomish River. There are no Wildlife Area units within its floodplain. The Snoqualmie River basin drains 693 square miles. Its principal tributaries include Cherry Creek (runs through Cherry Valley unit), Harris Creek (runs through the Stillwater unit), The Tolt River, Griffin Creek, Patterson Creek, Raging River, Tokul Creek, and the South, Middle, and North Forks of the Snoqualmie River.

Snoqualmie River Floodplain

The lower Snoqualmie River basin begins at Snoqualmie Falls (in King County) and generally drains north toward Snohomish County. At the base of the falls, the river is relatively steep, but it soon loses most of its elevation; the lower reaches of the Snoqualmie River are relatively flat. The river meanders in wide loops through a largely agricultural valley floodplain. Several tributaries join the Snoqualmie in its lower reaches and have relatively steep gradients and high-velocity flood flows. The largest tributary, the Tolt River, is partially regulated by the City of Seattle through its operation of a water supply dam on the South Fork Tolt River.

Downstream of Fall City the Snoqualmie River enters a broad valley with a wide floodplain that encompasses a broad valley floor, often ranging up to two miles wide. The valley floor contains numerous old and large oxbow ponds, side channels and shallow swales marking where the river once flowed. The lower Snoqualmie valley was once covered by continental glaciation that affected much of Puget Sound Lowland. The lower Snoqualmie River, from the falls to the Skykomish River, exemplifies the pattern of river valleys created by sub-glacial runoff in a glacial trough.

The meandering lower Snoqualmie has river banks and a distinct meander belt that are several feet higher than the surrounding floodplain, which result from river sediments that have been deposited adjacent to the channel within the broad and low gradient valley. The valley walls are composed of glacial and non-glacial sediments, with local areas affected by relatively large landslides.

The mainstem Snoqualmie flows in a sinuous and meandering single thread channel pattern, with many oxbow ponds and wetlands. However, with the exception of a few areas, there has been very little change in the river position or oxbows in the 130 years since the earliest mapping. The river appears to migrate slowly and to avulse infrequently. Consequently, lateral channel migration presents a lower level of flood hazard along much of the lower Snoqualmie River.

Snohomish River Floodplain

The Snohomish River is bordered almost entirely by levees built relatively low and designed to overtop during 1 food events that exceed a five-year return interval. Over 45 miles of levee protect about 20,000 acres of primarily agricultural lands. Most of these levees are maintained by diking and flood control districts. The County fully or partly assists in maintenance where County roads run along levees.

Damages along the Snohomish River are primarily from inundation and levee breaches. Costs to repair these breaches can easily run into the millions of dollars, and federal funding for such repairs has become much harder to secure. In the lower delta, deep weak soils have led to levee subsidence. Failures may occur even during non-flood times.

Flooding Problems

Historical records of flooding along the Snohomish and Snoqualmie rivers date back to the 19th century when pioneers first settled here. Flood season typically begins in November and continues through February. Historically, county rivers have flooded in every month but August.

In general, the first element leading to a potential flood is a heavy, fresh snow in the mountains. If a weather front with warm winds (usually from the southeast) and heavy rainfall follows the snow before it has a chance to settle and solidify, the potential for a flood exists. This is called a “rain on snow” event. It is rare for rain to cause major flooding without the other elements being present because flows generated in the forested mountains dwarf what is produced in the more developed lowlands. Therefore, development is not a major contributor to the flood flows on these rivers. High tides may be responsible for holding up the normal discharge of river runoff into Puget Sound and contributing to a flood event.

Although flood control structures such as dikes and levees protect properties during small floods, these facilities can increase flood damages if they fail. In an undiked river, floodwaters quickly rise over riverbanks and lose some of their destructive force as they spread over the floodplain. If sections of a river are diked, floodwaters are constricted so that the river is higher, faster and gains more destructive force. Dike breaches, which are common during large floods, can cause far more damage to lands and structures behind them than would occur under natural flooding conditions.

Since the lower Snoqualmie River’s banks are at a higher elevation than much of the valley floor, even relatively small overbank flows can result in flooding from valley wall to valley wall. In all, the relatively common overbank inundation appears to be a more prominent flood hazard than channel migration along the lower Snoqualmie River.

There are few modifications such as dams that are significant in the entire Snoqualmie basin, so flood flows are largely unaltered along the lower Snoqualmie mainstem. With headwaters and much of the eastern basin highlands in the Cascades and a drainage area of about 600 square miles at Carnation, the Snoqualmie basin typically responds to winter rains with flood levels that rise and fall slowly and steadily. With such high elevations and unregulated drainages, rain-on-snow events can be significant.

The low-gradient channel of the lower Snoqualmie meets the relatively steeper and faster-responding Skykomish River in Snohomish County, which can result in Skykomish River

backwater influencing the lower Snoqualmie as far upstream as Duvall. Table 12 summarizes flow frequencies for the lower Snoqualmie River at Carnation, which account for backwater effects from the Skykomish River.

Table 12. Lower Snoqualmie River Flows

Recurrence Interval (years)	Discharge (cubic feet per second)
10	58,200
50	82,400
100	91,800
500	113,300

Flood Events

Recent history has shown that King and Snohomish counties can expect an average of one minor river flood episode each winter. Winter floods inundate most of the 100-year floodplain at intervals of three to ten years. Large, damaging floods typically occur every ten years.

Recent events on the lower Snoqualmie River (in King County) include November 1990 and 1995 and February 1996. All produced widespread flooding. Two people were killed by floodwaters in the lower Snoqualmie River basin in the 1990s. Both failed in attempts to drive across the mile-wide valley bottom on flooded roadways. The November 1990 flood killed hundreds of dairy cows and other livestock in the lower Snoqualmie basin. Subsequent floods have not had similar animal mortality, in part because the dairy industry no longer dominates valley land use.

Homes and other structures throughout the lower Snoqualmie basin are subject to flood damage. For the most part, these structures were developed for agricultural use and have been placed on the highest portions of large floodplain parcels. Nonetheless, deep and fast flows are a hazard throughout the lower Snoqualmie River floodplain including the Stillwater and Cherry Valley units.

The lower Snoqualmie River floodplain also includes significant public infrastructure that is at risk of flood damage. State Highways 202 and 203 and other roads that cross the river are subject to closure when they are inundated with floodwaters. Some portions of these roads have been damaged by floodwaters.

Some of the larger floods in Snohomish County occurred in 1897, 1917, 1951, 1959, 1965 and 1975. The 1975 flood inundated most of the Snohomish River valley from Ebey Island up to French Slough. In the last quarter century, damaging floods took place in 1980, 1986 (dike failure on Ebey Slough completed flooded Ebey Island), 1989, 1990 (twice), 1995 (twice), 1996, 1999 and 2003. Table 13 shows the estimated dollar losses due to various floods.

Table 13. Flooding damage in Snohomish River Basin

Date of Flood	Dollar Loss
Dec. 1921	-----
Feb. 1932	\$8,460,000
Dec. 1933	\$9,900,000
Dec. 1943	\$1,660,000
Oct. 1947	\$144,000
Feb. 1951	\$16,600,000

Nov. 1959	\$9,900,000
Dec. 1964	\$4,200,000
Dec. 1975	\$42,400,000
Dec. 1977	-----
Dec. 1979	-----
Nov. 1986	\$2,000,000
Nov. 1990	\$3,611,000
Nov. 1995	-----
Feb. 1996	\$1,200,000
Nov. 1999	-----
Oct. 2003	\$4,900,000

The second 1990 flood, called the Thanksgiving Day flood, was the largest on record in Snohomish County, as both major tributary river flows peaked at the same time. This created the highest flood stage measured on the Snohomish River since 1906 (it was estimated to be a 60- to 100-year event) and caused severe damage throughout the county. The October/November 2003 floods caused significant damage throughout the Snohomish Basin, mainly from logjams and debris. During that flood event, a huge logjam occurred under the State Route 2 bridge at Ebey Slough. This bridge is one of the key links between Everett and I-5 and the rest of Snohomish County. Logjams have the potential to damage the bridge, closing it, or to rupture nearby water and gas lines, cutting off water and gas service for most of Snohomish County and possibly spilling gas into the slough.

Flood Protection

By 1910, early residents had already formed the first diking districts in the area. Government involvement in flooding and flood control also began early, primarily through the U.S. Army Corps of Engineers in the early 1900s. Early protection efforts included weirs, dikes and levees and snagging boats to remove instream logs. Through the 1970s, the general response to flood damage was to rebuild larger, more durable flood control structures along the lower Skykomish, Snoqualmie and Snohomish rivers.

There is no single system or set of continuous flood protection facilities along the lower Snoqualmie basin. However, there are many discontinuous bank protection revetments and training levees located at most of the outside river bends from near Tokul Creek at River Mile 39.5 all the way downstream to the Snohomish County line at River Mile 6. Many of these facilities probably originated as privately constructed bank protection along farm properties many decades ago.

In addition, the two King County flood control bonds of the 1960s funded construction or significant improvement for several relatively long levees. Most of the lower Snoqualmie flood facilities are not intended to contain significant flood flows. None of the lower Snoqualmie River facilities satisfy federal certification criteria to be mapped as reliable 100-year flood protection. Deficiencies include a lack of sufficient containment capacity, problems with structural stability, and problems with erosion resistance.

Flood control structures are becoming increasingly difficult to construct and repair since Puget Sound Chinook salmon and bull trout were listed as threatened under the federal Endangered Species Act. Both permitting and mitigation requirements are more stringent, and federal funding for repairs to flood control structures is difficult to obtain.

Preparations Before a Flood

When a flood watch is issued, all Wildlife Area staff need to take the following steps to ensure they (and any visitors in the floodwatch area) will be ready to evacuate should the condition escalate:

- Learn flood-warning signs and the local community alert signals.
- Have check valves installed in building sewer traps and septic systems to prevent flood waters from backing up. As a last resort, use large corks or stoppers to plug showers, tubs, or basins.
- Fill the gas tank in all vehicles needed to evacuate staff and map out a route to higher ground. Try to avoid routes that cross streams.
- Stock your vehicle with supplies, including non-perishable food, water, first aid kit, flashlights, blankets, dry clothing, large trash bags, battery operated radio and extra batteries. Remember special needs items such as medications, and special dietary foods.
- Fill bathtub(s) and sink(s) with water for drinking, as water and other utilities may fail.
- Use the Mill Creek Regional Office (working hours) /Regional Wildlife Program Manager (off hours) as your out-of-area phone contact (after a disaster it is often easier to call long distance). Make sure all staff know these phone numbers and call in.
- Teach staff how to turn off gas, electricity, and water at the office and residence.
- Listen or look up weather updates, river and flood information (Table 14).

Flood Warning Programs

These programs warn residents and agencies of impending floodwaters on major rivers so they can take action and prepare themselves before serious flooding occurs. In most locations, the warning system provides at least two hours lead time before floodwaters reach damaging levels. This program does not take the place of individuals and local groups making their own flood disaster plans.

Table 14. Emergency Service Contacts

Agency	Phone Number	Internet Address
King County Flood Center (open during floods)	206-296-4535 or 1-800-768-7932	www.dnr.metrokc.gov/wlr/flood/flood.htm
King County River Gage Information (recorded message)	206-296-8200 or 1-800-945-9263	www.dnr.metrokc.gov/wlr/flood/flood.htm
King Co. Office of Emergency Management (housing and assistance)	206-296-3830	www.metrokc.gov/prepare/
Road closures in unincorporated King County	206-205-9150	www.metrokc.gov/kcdot/roads/roadalert/default.aspx
Snohomish County Real Time Flood Warning Information	425-388-3653	http://www.co.snohomish.wa.us/PWApp/SWM/floodwarn/index.html
Snohomish County Department of Emergency Management	425-423-7635	

When high water conditions are imminent, river gages which measure the flow and stage (depth) of the major rivers in various locations are monitored by county staff on a 24 hour basis, so that actions can be taken depending on river conditions.

Counties also work closely with the National Weather Service to obtain forecast information used to make flood predictions. Close coordination occurs with the county's Office of Emergency Management, Roads Department, and other agencies to obtain up-to-date information about problems sites, road closures, evacuations and other emergency services. Coordination also occurs with the U.S. Army Corps of Engineers and Public Utilities districts regarding dam operations. Personnel at the Flood Warning Center are available to answer questions and help interpret gage readings during a flood event.

Once a warning is issued by the National Weather Service or by the County, residents should prepare for flooding. Becoming familiar with the relationship between upstream gage readings and local flood characteristics can help you prepare your individual emergency plan. Residents should keep informed of changing river conditions and make early preparations in case of major flooding.

During and After a Flood

The most important consideration during a flood is the safety of WDFW staff, visitors and animals. Flood waters can rise very rapidly. Be prepared to evacuate before waters reach you or leave you stranded. Keep your radio tuned to your local Emergency Alert System (EAS) station to find out if you need to evacuate and how much time you have. ***A Flood Warning*** from the National Weather Service means flooding is occurring or will occur soon. Evacuate if you are told to do so.

Flood Waters – The Most Dangerous!

Rushing water from floods and flash floods is extremely deceptive and dangerous. It is possible to be swept away in flood waters only one-foot deep.

Remember:

- Police barricades are there for your protection. **DO NOT DRIVE AROUND THEM.**
- Walking or driving through flood waters is the most dangerous thing you can do.

After A Flood

Do not use food or water that has come into contact with contaminated flood waters. Until the public water system has been declared safe, water for drinking and food preparation should be boiled vigorously for ten minutes.

Re-entering Your Home or Office

1. Before entering, check for structural damage that could cause collapse. Turn off any outside gas lines at the meter or tank and let the structure air for several minutes.
2. Do not strike a match when entering. There may have been a gas leak.
3. Be careful about turning the power on again. Watch for electrical shorts or live wires. Do not use water damaged appliances.
4. Document your flood losses and contact the Department for flood loss claims.
5. Follow procedures for safe clean-up of household items, food, water supply, and property.
6. Dry your house/office/shop slowly. Carpets and drywall may have to be removed. Remember, water can get trapped between walls and will not dry.

7. If your home or business has received extensive structural damage, this may be the time to elevate or flood-proof the structure.

Responsible Flood Protection Agencies

Title 85 of the Revised Code of Washington allows for any portion of a county requiring diking to be organized into diking districts. Once a diking district is organized, the habitants elect a board of commissioners (non-paid), and impose taxes for the purposes of maintaining flood protection. They can assess those within the district that are receiving benefits as well as petition the county, state and federal government for funding and assistance. Funds raised are used to construct and maintain dikes, levees, tide gates, keyways and bank stabilization. WDFW pays approximately \$9,210 per year for districts to maintain their dikes.

Floods that occur within the local diking districts are the responsibility of those local districts. Floods that occur outside those districts are the responsibility of the county. The county Departments of Emergency Management provide emergency management services to many cities and unincorporated areas of their county. The Snoqualmie Wildlife Area and its satellite units fall under the partial or total jurisdiction of several diking districts, and/or are the responsibility of the county (Table 15).

Table 15. County Diking Districts

Unit Name	Diking District	County
Cherry Valley	King Co. #7	King
Corson	N/A	Snohomish
Crescent Lake	N/A	Snohomish
Ebey Island	Snohomish Co. #1	Snohomish
Spencer Island	(Snohomish County)	Snohomish
Stillwater	N/A	King

Reporting Floods

Report any flood on or adjacent to all units of the Snoqualmie Wildlife Area by **dialing 911** and/or contact one of the emergency numbers listed in Table 14. The following table (Table 16) provides WDFW telephone numbers IN PRIORITY ORDER of Department staff to be contacted in the event of a flood.

Table 16. Department of Fish and Wildlife Contacts

Name and Position	Work Phone	Cell Phone	Home Phone
John Garrett Skagit W.A. Manager	360-445-4441	360-333-8125	360-445-5354
Belinda Schuster Skagit W.A. Assistant Manager	360-445-4441	360-333-2131	360-336-3219
Curran Cosgrove Habitat Technician Skagit W.A.	360-445-4441	425-330-7725	360-333-0833
<i>For King County units:</i>			
Lance Stevens Wildlife Agent	State Patrol Dispatch	425-466-8584	425-489-7834

Kim Chandler King County Sergeant	425-775-1311, ext 122	206-300-5616	425-821-5465
<i>For Snohomish County units:</i>			
Julie Pinasco Wildlife Agent	State Patrol Dispatch	425-231-6593	360-563-0319
Randy Lambert Snohomish County Sergeant	425-775-1311, ext 123	425-501-3530	360-794-6915
Regional Office, Mill Creek	425-775-1311	N/A	N/A
Lora Leschner Regional Wildlife Program Manager	425-775-1311 (ext 121)	425-231-7618	360-435-3158

APPENDIX 6. SNOQUALMIE WILDLIFE AREA FISH BEARING FEATURES

FEATURE TYPE	FEATURE STATUS	WILDLIFE AREA UNIT						
		CHERRY VALLEY	CORSO N	CRESCENT LAKE	EBEY	SPENCER ISLAND	STILL-WATER	TOTAL
Culverts	Fish Bearing	21	4	2	1	2	7	37
	Fish Barrier	4 *(P)	2			2 (P)	2 3 (P)	2 9 (P)
Dam/ Lake Level Control	Fish Bearing	1					1	2
	Fish Barrier	1					1	2
Fishways	Fish Bearing					2		2
	Fish Barrier					2 (P)		2 (P)
Pump or Water Diversion	Fish Bearing	1						1
	Fish Barrier	1						1
Total Fish Bearing Features								42
Total Barriers								7
Total Partial Barriers								11
Total Unscreened Diversions								1

(P) indicates partial barrier

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